

MacWEEK

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Ofoto
Accurate desktop color
closer to reality

Presenter Professional
Modeler app first rate, but
renderer app needs work

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Comparison of two low-cost
slide scanners

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In Reviews

MacWEEK 200



Our annual survey of largest Mac sites details purchase plans

This year's MacWEEK 200, our fifth annual study of the largest Mac-using sites in the United States and Canada, found that managers have decided that processing power and portability are key to their enterprises.

Making their way through the maze of new Mac models, managers have come down solidly on the high end. Quadra and Centris machines make up 46 percent of all the Macs the sites surveyed plan to purchase.

Those models account for 34 percent of planned purchases among the colleges and universities on the Education 50, MacWEEK's third annual survey of the top Mac-using educational institutions.

What companies are making all these purchases? Eastman Kodak Co., which placed No. 1 last year, did so again this year, proving its ongoing commitment to Mac technology. The University of Michigan at Ann Arbor topped our Education 50 list.

To find out which models the top sites have installed, what they're planning to buy and the creative ways in which they're using Mac technology to solve business problems, see Page 41.

Vendors draw up standard for sharing pen-based data

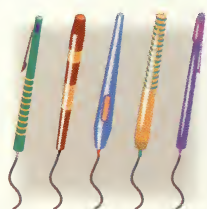
By Nathalie Welch

Atlanta — An alliance of vendors, including Apple, Microsoft Corp., General Magic Inc., Lotus Development Corp. and GO Corp., will ink a new page in pen-based computing at Comdex/Spring '93 here this week.

The partners, led by GO PenPoint application developer Slate Corp., have spent several months defining a standard, called Jot 1.0, for sharing pen-generated data across both pen-enabled and traditional computer platforms.

Jot is a new data format for the "digital ink" created when a user writes on a computer with an electronic pen. Jot will let users

share handwritten notes, signatures and drawings on platforms ranging from handhelds to mainframes — even if the platform cannot generate its own ink or recognize handwriting.



Jot will store information, such as the type of pen tip used, the color of the ink and the angles used to write, in such a way that an application unfamiliar with a particular property can ignore it.

If a system or application understands ink, it could take scribbles recorded on another platform and convert them to text locally.

Apple said it has not determined in what products it will implement

See Jot, Page 147

Apple lightens price of sluggish models

Centris 610, PB 165c, Duo 210 get discounts

By Jon Swartz

Cupertino, Calif. — In an effort to stimulate sales of slow-moving models and keep pace with PC competitors, Apple last week informed dealers that it is trimming prices on a variety of Macs.

The dealer price cuts — from 8 percent to 16 percent on machines from the Macintosh Color Classic to the PowerBook 165c — are expected to be a precursor to official retail cuts next month. Apple often cuts the price it charges resellers

prior to announcing new list prices.

At the same time, Apple told dealers it is slashing list prices for two printers. The Personal LaserWriter NTR has been cut 29 percent, to \$1,179 from \$1,649, and the Apple Color Printer has been shaved 29 percent, to \$1,659 from \$2,349 (see chart, Page 148). The prices below are approximations:

► **PowerBook 165c.** Apple's color notebook took the biggest dealer price cut — \$500, or 16 percent — to \$2,650. The passive-matrix model has recorded sluggish sales since it became widely available in March.

► **Centris 610.** Dealer prices on all four models were reduced by about \$150, or 7 percent to 10 percent. The 4/80 configuration now costs dealers \$1,325; the 4/80 with Ethernet is \$1,400; the 8/230 is \$1,850; and the 8/230 with CD-ROM is \$2,150.

► **Color Classic.** Apple has

See Price cuts, Page 148

Tech Analysis

AppleScript could bring Apple events into mainstream

By Raines Cohen

San Francisco — More than two years after the release of System 7, one of its most powerful technologies — Apple events — remains misunderstood, underappreciated and rarely supported. But with the emergence of AppleScript, the company's new Apple-events-based scripting system, more users and programmers may soon be using the technology to integrate and customize applications.

Apple events lets programs communicate behind the scenes with others by way of a System 7 facility

See Apple events, Page 146

Open Sesame! summons agents to automate tasks

By April Streeter

Cambridge, Mass. — It can't bring you coffee or clean off your desk, but an intelligent-agent program now under development for the Macintosh can learn to do routine desktop tasks.

Charles River Analytics Inc. will take the wraps off Open Sesame!, agent software that runs in the background on System 7 Macs at Mac-

world Expo in Boston this August.

The program, expected to cost about \$100, observes repetitive patterns in opening and closing files and applications, arranging desktop windows, and emptying the Trash.

Open Sesame! will learn selected actions supported in System 7's core, required and Finder suites of Apple events. After observing an

See Open Sesame!, Page 148

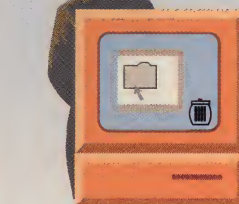
Mac agent automates routine tasks

Agent observes user constantly emptying Trash after depositing file.



Observation

Agent asks: Shall I empty Trash?



Instruction

User instructs agent: "Yes, empty Trash five minutes after file is dropped."

Agent empties Trash automatically according to user instructions.



Automation

Real Soon

HP color inkjet earns its stripes

By Steve Hannaford

Over the years, Hewlett-Packard Co. has perfected its inkjet-printer technology, and the company's black-and-white and color models have gained a reputation for reliability, affordability and ease of use. Now HP has lined up yet another well-made, reasonably priced desktop printer: the HP DeskJet 1200C/PS, a 300-dpi, letter-size, color inkjet device that features Adobe PostScript Level 2 and offers extensive networking options.

We looked at a prerelease version of the DeskJet 1200C/PS; while all the features in the product were not accessible, we got a very good picture of the printer's usefulness in a business environment.

See DeskJet, Page 148

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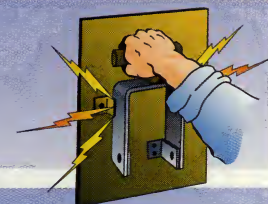
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StyleWriter to hit the road in battery-powered version

By Matthew Rothenberg

Cupertino, Calif. — Apple next month will weigh in with a portable version of its StyleWriter inkjet printer, sources said.

The Portable StyleWriter, which will reportedly carry a street price of less than \$400, is based on Canon U.S.A. Inc.'s 83-character-per-second, 360-dpi BJ-10ex engine.

The QuickDraw printer folds up to 1.9 by 12.2 by 8.5 inches, slightly larger than a PowerBook, and weighs 4 pounds without a power supply, sources said. It runs on a rechargeable

nickel-cadmium battery or an AC adapter, both of which will ship with the device. The Portable StyleWriter can reportedly output about 30 pages on a single charge. A battery charger will be included, and a 50-sheet paper feeder will be offered as an option.

Sources said the printer, which has a Centronics parallel interface, will ship with a parallel-to-serial converter cable and driver from GDT Softworks Inc. of Burnaby, British Columbia.

Apple and GDT declined to comment. □

Support still high on MacIS wish list

By Leonard Heymann

Mason, Ohio — MacIS last week disclosed its latest Apple wish list, which, based on past history, will help shape Apple's agenda for the coming year.

Support heads the list of priorities, based on a membership vote of MacIS (Managing Apple Computers in Information Systems). Half of the top 10 list is new, reflecting the fact that Apple recently delivered several products that were high on last year's list, including the Apple Workgroup Server 95 and support for SNMP (Simple Network Management Protocol).

► **Support.** At MacIS' recent conference in San Antonio, Apple briefed the group on an extensive help-desk support program due later this year. Now the Mac managers want to be sure the company delivers the goods. "The old issue was, 'Tell us what you're going to do,' and now it's 'Deliver what you promised,'" said Brian Connes, manager of information systems at DHL Airways Inc. of Redwood City, Calif., and MacIS

director in charge of voting on the list.

► **Security.** Network and hardware security were combined for the first time, pushing the issue to No. 2 on the priorities list.

► **PowerPC.** MacIS wants Apple to release more information on its PowerPC strategy, including comparing it to Intel Corp.'s Pentium microprocessor and the Microsoft Windows NT operating system.

► **AOCE.** The group is seeking more information on the AOCE (Apple Open Collaboration Environment) and wants to ensure cross-platform support.

► **VITAL.** MacIS asked Apple to offer an electronic VITAL guide and form a consortium to back the architecture.

► **DAL.** Some 30 improvements to the Data Access Language were requested, including providing more support for Windows and binary large objects.

► **ARA.** MacIS urged Apple to rebundle the AppleTalk Remote Access client with PowerBooks, a move that is expected this summer; develop an Apple-logo multiline ARA server; and improve dial-in security.

► **Improve Mac OS.** The group urged Apple to provide a protected memory mode, better error messages and a "mini" System 7, among other enhancements.

► **Bug database.** Connes said MacIS wants Apple to acknowledge that bugs do occur in system software and to provide an Apple-Link database of bugs with expected resolution dates.

► **Software licensing.** MacIS urged Apple to offer a more flexible licensing program in more distribution channels. □

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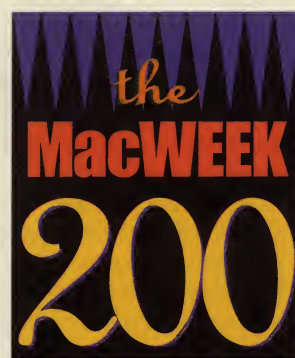
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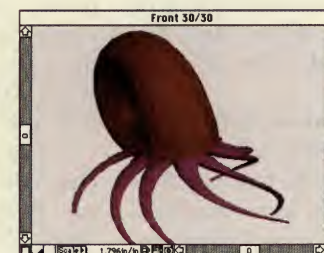
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MacIS top 10 wish list

'93 '92 ISSUE

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2	5	Enhance Macintosh security
3	*	Communicate PowerPC strategy
4	*	Ensure AOCE cross-platform support
5	1	Continue VITAL development
6	3	Provide more DAL tools
7	7	Improve ARA/rebundle with PowerBooks
8	*	Enhance Mac OS
9	*	Develop "bug" database
10	*	Roll out software licensing program

*Wasn't a top 10 issue.

Motorola posts processor plans

Chips announced for CD-I, PDAs

By Henry Norr

Scottsdale, Ariz. — Motorola Inc. last week announced a new low-power version of the 68040, plus specialized microprocessors for personal intelligent communicators and for Compact Disc-Interactive entertainment systems.

The announcement came at a briefing for press and analysts here, where a division of Ford Motor Co. also endorsed the PowerPC (see story below).

► **The low-power '040**, officially called the 68040V, will answer the prayers of those who have hoped for '040 performance in a PowerBook, but not for nearly a year: Volume production is not expected to ship until the second quarter of 1994.

Like the 68LC040 used in the Centris 610, the '040V will provide all features of full '040s except a floating-point math unit. The chip will be offered in 25- and 33-MHz versions.

Yet the new '040V, which will be based on 0.5-micron process technology, consumes 40 percent to 60 percent less current than existing versions of the '040, according to Motorola. It runs on 3.3-volt

power, compared with the 5-volt power required for current '040s; in full operation at 33 MHz, it uses only 1.5 watts, a sixth of the power dissipation of the original version of the processor. Power-management functions are built-in, including an instruction that shuts down all active circuits.

The company did not announce pricing, but Jack Browne, vice president and director of marketing for Motorola's High Performance Microprocessor Division, said prices should be similar to those of current '040s. In quantities of 1,000, those processors now sell for \$245 at 25 MHz, \$290 at 33 MHz and \$393 at 40 MHz.

► **The personal communicator chip**, called the 68349 or Dragon I, was designed specifically to run Magic Cap, General Magic Inc.'s "communicating applications platform." It is expected to make its first appearance coupled with a proprietary chip called the Astro in a "personal intelligent communicator" to be released later this year by Motorola's Paging and Wireless Data Group (see MacWEEK, Feb. 8).

Motorola said the chip, which has a power-dissipation rating of only 300 milliwatts, is also suitable for use in personal digital assistants or other communications devices.

The core of the integrated microprocessor is a full 32-bit, 68000-derived central processor supplemented by a configurable instruction cache and data memory; other built-in features include a high-speed direct memory access controller and a dual-channel serial communications port.

Samples of both 5- and 3.3-volt implementations running at 16 and 25 MHz are available now, according to Motorola; volume shipments are expected in the fourth quarter. Prices will start at \$28.20 for the 16-MHz version in quantities of 10,000.

► **The CD-I chip**, called the 68341, is intended for use in home-entertainment and educational systems and other low-cost, low-power applications, the company said. Volume shipments of 3.3- and 5-volt versions running at 16 and 25 MHz are expected in the fourth quarter.

Browne, whose group is responsible for all of Motorola's 680x0-based products, said the company will also offer embedded controllers based on the '040V and the 68060, an addition to the family that is expected to ship in volume in about a year. Although it will offer about three times the performance of a 25-MHz '040 while drawing only a fraction of the power, the '060 may never appear in Macs; by the time it ships, Apple will already have begun its transition to the PowerPC, and the improved 603 and 604 versions of that chip will be just over the horizon.

Browne said, however, that he still hopes to persuade Apple to leave room for the '060's 10 additional pins when it develops low-power '040V-based systems. That way, Apple would leave itself a high-performance hedge in case the transition to RISC proves problematic. □

Ford Motor to use PowerPC-based microcontrollers for engine control

By the end of the decade, the PowerPC could be a fixture on the nation's highways as well as its desktops.

In the latest endorsement of the new RISC processor, the Ford Electronics Division of Ford Motor Co. announced at a briefing in Scottsdale, Ariz., last week that it intends to build PowerPC-based microcontrollers into future versions of its Electronic Engine Control modules. The device could also be adapted for other functions, such as voice control and navigation systems, a spokesman said.

Ford and Motorola will collaborate on the development of the microcontroller, the first announced embedded application for the RISC architecture being developed jointly by Motorola Inc., IBM Corp. and Apple. Ford had previously announced its intention to use Motorola's original 88000 RISC processor for the project.

PowerPC-equipped vehicles

won't start shipping until about 1997 or 1998, a Ford official said. Eventually, all Ford cars will incorporate at least one PowerPC-based controller and more likely several, according to Brian Wilkie, vice president and general manager of Motorola's Advanced Microcontroller Division.

Motorola projects that annual production of PowerPCs will reach nearly 18 million units by 1997, according to Phil Pompa, director of marketing for the company's RISC Microprocessor Division. He also said more operating systems are likely to be available on the PowerPC than on any other microprocessor; a slide he displayed showed not only the four systems already announced for the platform — PowerOpen, Taligent, Solaris and the Mac operating system — but also Microsoft Windows NT; IBM's OS/2; Novell Inc.'s NetWare; and Unix System V, Release 4. — *By Henry Norr*



Fifth Generation's FastBack will get a new interface in the Express version, which hides much backup complexity from the user.

Fifth Generation announces a new generation of utilities

By Robert Hess

Baton Rouge, La. — Fifth Generation Systems Inc. rolled out new versions of several of its Mac utilities last week.

► **CopyDoubler 2.0**, to be released this week, will let users copy in the background, queue up multiple jobs and schedule copy operations for later execution. The Fast Replace feature has been improved and can be combined with the scheduling feature to provide a basic file-synchronization system, the company said.

The new version gives users the option of having the Finder, rather than CopyDoubler, perform a particular copy operation — to bypass a CopyDoubler queue, for example. Version 2.0 also offers control over compression and decompression of files during copying if Fifth Generation's AutoDoubler is installed. Verification of copied files has been expanded to include all media, including file servers.

Upgrades to the \$59.95 product are \$14.95.

► **Fastback Express**, the compa-

ny's \$99 backup utility, next month will be updated to Version 2.0. The utility can now copy files in Finder format as well as the proprietary compressed format used in the original release. The new version introduces "self-extracting backups"; users can now create backups that can be restored even when the user doesn't have the FastBack software. The program will give AutoDoubler owners the option of using that program's compression engine in lieu of FastBack compression.

Upgrades are \$29.

► **DiskLock PB**, a \$59 subset of the company's DiskLock security software, is aimed at PowerBook users. It secures a disk on sleep, shutdown and restart. Because DiskLock PB is installed at the SCSI driver level, it, unlike other utilities, cannot be defeated by starting up with a floppy, Fifth Generation said.

► **MacPak 1.0** is a \$149 collection that contains AutoDoubler; CopyDoubler 1.0; FastBack Express; DiskLock PB; an application launcher called Launch Pad; and the desk accessories from the now-discontinued File Director package, including DiskTools and PhonePad DAs.

► **SuperLaserSpool**, the company's \$149 print spooler, this month was upgraded to Version 3.1. The update improves memory management. Users can spool to multiple disks, and PowerBook users can print to disk, then spool to a printer at a later time. Upgrades are \$15.95.

In other news, the company announced a \$129 bundle of its \$89.95 AutoDoubler 2.0 and \$79.95 DiskDoubler 3.7.7. The bundle is available through Sept. 30.

Fifth Generation is also offering a trade-in that lets users of competing products buy its \$149 Public Utilities for \$59 through Sept. 30.

Fifth Generation is at 10049 N. Rieger Road, Baton Rouge, La. 70809. Phone (504) 291-7221 or (800) 873-4384; fax (504) 295-3628. □

InForms Filler coming to Mac

By Lisa Picarille

Orem, Utah — WordPerfect Corp. is readying a Mac version of the Filler portion of InForms, its electronic forms package.

With InForms Filler, due in July for Windows and late this year for the Mac and Unix, users will be able to enter data, perform database queries and access supported databases but neither alter nor create forms. Once forms have been completed, they can be routed using WordPerfect Office 4.0, Lotus Development Corp.'s cc:Mail or Microsoft Mail. A gateway to read Lotus Notes databases is also included.

A \$495 Designer module, due in July for Windows, will let users cre-

ate forms that include objects such as entry fields, buttons, check boxes and tables and link them to a variety of databases, including Microsoft Corp.'s SQL Server, Borland International Inc.'s Paradox and dBASE, Oracle, and Sybase.

InForms Designer for the Mac is planned but not yet under development, WordPerfect said.

The Filler is \$199 with documentation and \$149 without documentation. Concurrent-user licenses range from \$495 for a five-pack to \$6,995 for 100 users.

WordPerfect Corp. is at 1555 N. Technology Way, Orem, Utah 84057-2399. Phone (801) 225-5000; fax (801) 228-5077. □

Looks like Mac users just got their very own HP LaserJet.



The new generation HP LaserJet 4M printer.

At last. An HP laser printer built specifically for the Mac—the new LaserJet 4M. A laser printer with everything Mac users need. From built-in PostScript™ Level 2 software from Adobe™ to standard LocalTalk and optional EtherTalk.

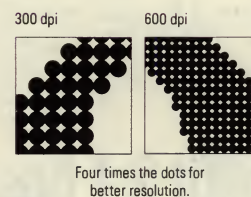
The finest print quality in its class.

Thanks to HP's microfine toner, Resolution Enhancement technology, and advanced engine designed expressly for 600 x 600 dpi, the LaserJet 4M printer delivers the finest print quality of any 600-dpi machine available.

And with a new RISC processor and 6 MB of standard memory accelerating formatting and I/O speeds, complex PostScript and graphics files are rendered faster and more clearly than ever before.

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As well as the options of a 500-sheet tray and power envelope feeder.



Four times the dots for better resolution.

And it's designed to be shared simultaneously by PCs and Macs. Automatic language switching between PCL 5 and PostScript, and 3 hot I/Os give mixed environments greater flexibility. Without compromise to either.

Of course, with the HP LaserJet 4M printer, you'll enjoy HP's renowned quality and reliability. All for only \$2,399.* So call 1-800-LASERJET (1-800-527-3753) Ext. 7340** for print sample† and comparison disk. Or visit your nearest authorized HP dealer.



The HP LaserJet 4M is the one for all. Macintosh and PC alike. This new generation provides superior output with 600 dpi, Resolution Enhancement technology and microfine toner. 6MB built-in memory means that PostScript files and full-page graphics print out crisp, clear and fast.

True 600 dpi creates rich, full-dimensional text and graphics.

Smoother curves, no jagged edges, thanks to HP's exclusive Resolution Enhancement technology.

Microfine toner makes 600-dpi output look even sharper.

35 PostScript Type 1 typefaces for Mac and PC PostScript language users, 35 Intellifont and 10 TrueType typefaces for PC users produce a broad range of document styles.



LabVIEW gets slew of new features

Code now 80 percent platform-independent

By Raines Cohen

Austin, Texas — National Instruments Corp. this week will announce an upgrade to LabVIEW, its multi-platform graphical programming environment for laboratory systems.

LabVIEW 3.0, due in July, will provide Mac users with enhancements already included in the Windows and Sun versions, as well as several new features.

► **Cross-platform porting.** LabVIEW-based applications can now move among platforms with little or no modification. National Instruments said 80 percent of the program's code is platform-independent.

► **Measurement-based virtual instruments (VIs).** New VIs mimic traditional frequency-analysis instruments and offer new display options and conversions.

► **Testing tools.** National Instruments provides source code that users can customize to create automated test suites for LabVIEW applications.

► **New charting.** Version 3.0 can create intensity charts and graphs that show 3-D values as colors.

► **Simpler language.** LabVIEW's programming language now supports local variables, occurrence functions and physical units.

LabVIEW will remain \$1,995 for Macs and Windows and \$3,995 for the Sun version in single-user licenses.

"We do a lot of data acquisition," said Dennis Erickson, senior electronics engineer with the Bonneville Power Administration's Ross complex in Vancouver, Wash. Erickson, who beta tested both the Macintosh and Windows versions of LabVIEW 3.0, said, "I've got to rewrite an awful lot of acquisition code [to use LabVIEW 3.0], but it will be worthwhile because there are a lot of new things [the upgrade] will let me do."

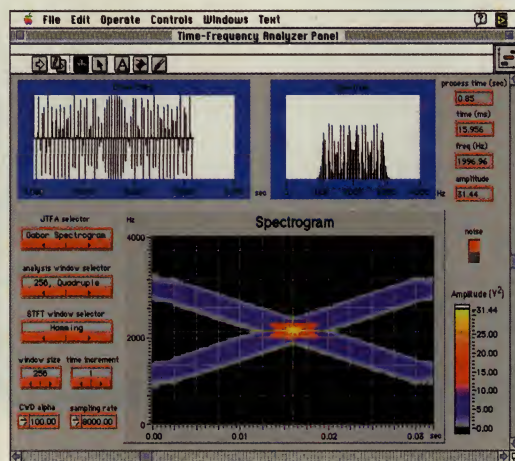
On the other hand, Erickson criticized the "lowest common denominator" multiplatform interface in Version 3.0. "I miss the floating palette and easier navigation," he said. "The extra steps [Version 3.0] requires disappoint me a lot."

National Instru-

ments this week will also announce LabVIEW Application Builder, a \$995 program that converts LabVIEW programs into stand-alone applications. Users who want to sell the programs they create must pay a license fee to National Instruments.

Also slated for introduction this week is LabVIEW Run-Time System, a \$495 application that runs LabVIEW programs but lacks development tools.

National Instruments Corp. is at 6504 Bridge Point Parkway, Austin, Texas 78730-5039. Phone (512) 794-0100 or (800) 433-3488; fax (512) 794-8411. □



LabVIEW 3.0 from National Instruments includes new, simpler data-graphing virtual instruments. It can create intensity charts and graphs that show 3-D values as colors.

Faster EISToolKit 2.1 has new tutorial, templates

By Raines Cohen

Wilmington Del. — MicroStrategy Inc. last week shipped a new version of EISToolKit, an application development environment for client-server executive information systems and decision support systems.

EISToolKit 2.1 is based on Informix Software Inc.'s Wingz spreadsheet application for the Mac, Windows, and now the Sun Open Look and Motif Unix graphical interfaces. It lets users combine presentation graphics, database connectivity and spreadsheet modeling tools with a programming language. A point-and-click SQL generator provides access to more than 50 relational and nonrelational databases.

Version 2.1 includes enhanced documentation with a new tutorial that takes users through the process of creating applications with the system.

The company said the new version runs much faster than before, especially when parsing database queries and drawing windows.

Users can copy several new graphical templates in the package for use in their own applications.

The new version will be compatible with Wingz 2.0, which is due by early next month for Windows and later this year for the Macintosh. Wingz 2.0 will add improved array handling and a tighter link

with Informix host databases.

The EISToolKit designer version, which can create applications, is priced at \$1,995; the user version sells in a 10-pack for \$7,995. Current users can upgrade free.

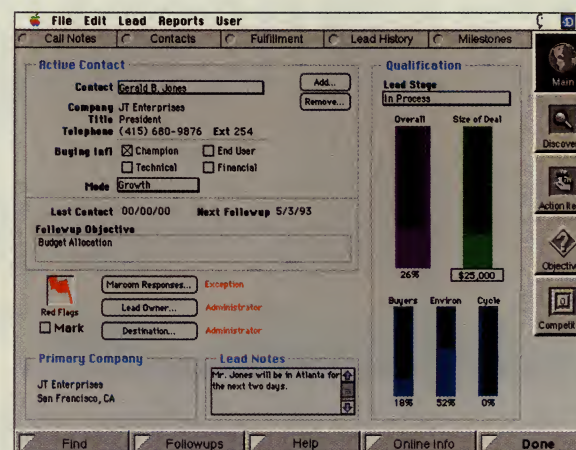
MicroStrategy Inc. is at 1 Commerce Center, Wilmington, Del. 19801. Phone (302) 427-8800 or (800) 927-1868; fax (302) 427-8810. □

For the record

The May 17 issue reported that InterCon Systems Corp. said it will bundle InterSLIP with all its products. The company now says InterSLIP will be bundled only with TCP/Connect II.

A May 17 story on Comstock Inc.'s Stock Photography on CD-ROM incorrectly implied that only thumbnail images are available on the disc. The CD-ROM includes full-size TIFF images.

The May 3 issue gave an incorrect fax number for SoftArc Inc. The correct fax number is (416) 754-1856.



Sales Navigation from R.M. Dudley helps users compile and track information about potential customers.

Client-server app helps smooth sales and marketing operations

By Kirsten L. Parkinson

Burlingame, Calif. — A new client-server application from R.M. Dudley Corp. aims to help companies streamline their sales and marketing operations.

Sales Navigation, based on ACI US Inc.'s 4th Dimension database, lets users collect and store information about potential customers, follow up leads, and distribute product information.

Features include:

► **Discovery.** Sales Navigation has a customized set of questions designed to help users gather information about potential customers. Users compile information gathered through direct mailings or telemarketing and then enter it into the central database.

► **Contact management.** The program can store multiple contacts for a single company and classify them by the role they will play in purchasing decisions and the type of product information they will need. The contact screen also includes follow-up activities and qualification information, such as where the lead is in the sales cycle.

► **Follow-up.** Based on a customized sales strategy, Sales Navigation automatically reminds users of

follow-up calls to make and letters to send out each day. Once a lead has all the relevant information and is definitely interested in the product, the compiled information can be passed on to salespeople for the final sale.

Other Sales Navigation features include report options and multiple levels of password protection.

"Our specialized network super-servers are a highly complex technical product, which needs a lot of education of users and preusers," said Debi Thomas, manager of NetFrame Systems Inc.'s customer information center in Milpitas, Calif. "I take raw leads, process them through [Sales Navigation], determine a need for our product and educate the people. Because of the software, I'm able to handle 600 or 700 people myself. It also shortens our sales cycle and helps us come up with new leads."

Prices for Sales Navigation software range from \$30,000 to \$60,000. Configuration and customization are extra. For example, a \$30,000 system includes the server application, a five-user license, and a limited amount of consulting and configuration.

R.M. Dudley Corp. is at 1799 Old Bayshore Highway, Suite 200, Burlingame, Calif. 94010. Phone (415) 697-1650; fax (415) 697-1816. □

Freeware program BBEdit going commercial

By Henry Noss

Natick, Mass. — BBEdit, a freeware text editor with special features for developers, is going commercial.

Rich Siegel, the program's author, this month announced BBEdit 2.5, a much enhanced version that lists for \$99, as well as BBEdit Lite, a stripped-down version that will remain free.

Version 2.5 allows direct integration with Symantec Corp.'s new Symantec C++ and Think C 6.0 development tools for the Mac, as well as with other Think tools.

BBEdit can, for example, inform the Think Project Manager via Apple events when a file is changed, and it enables users to initiate compiles and runs without leaving the editor.

In addition to several new text-manipulation options and enhancements to other features, Version 2.5 also includes a new disk browser. With support for XTND now integrated into the program's Open dialog, users can preview any file that can be translated on any mounted volume.

BBEdit 2.5 is available for \$49 to users of previous versions and own-

ers of Think C or Pascal, Apple's Macintosh Programmer's Workshop, Nisus Software Inc.'s QUED/M, Baseline Publishing Inc.'s Vantage, and the shareware editor Alpha.

BBEdit Lite, which lacks XTND support and several developer-oriented features, is available free from on-line services or on disk from Siegel for \$5. Lite users can upgrade to Version 2.5 for \$49.

Rich Siegel is at 1 Larkspur Way, No. 4, Natick, Mass. 01760. Phone and fax (508) 651-3561. □

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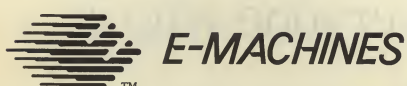
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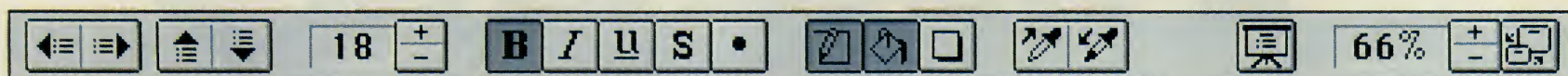
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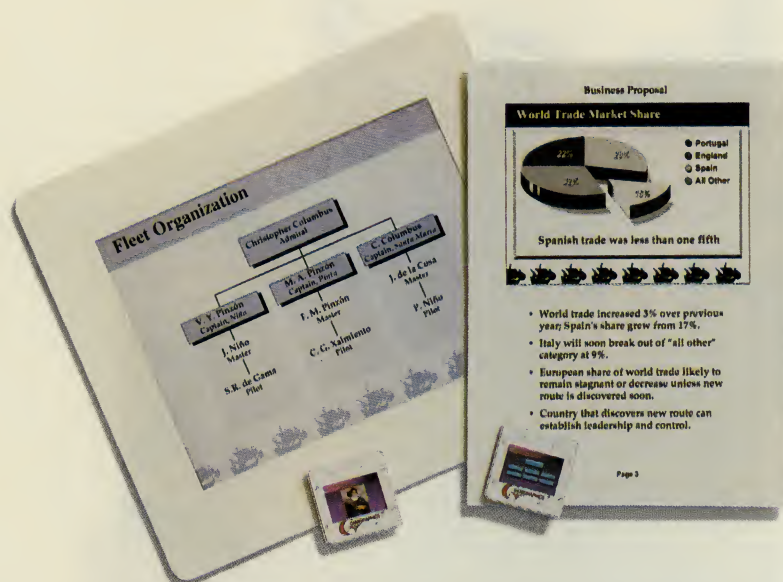
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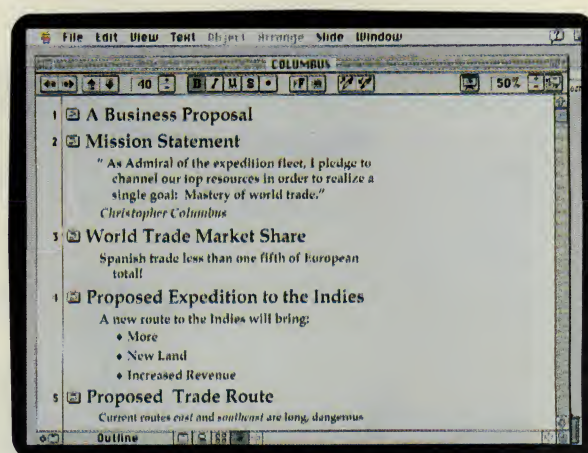
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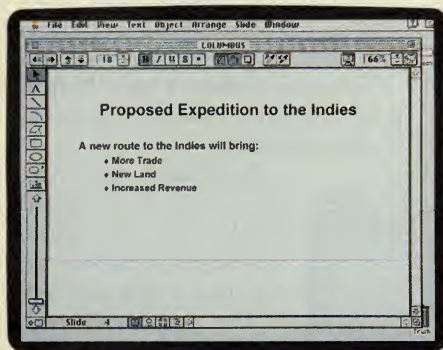
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required: title page of user's manual or Disk 1 of the program. Reseller prices may vary. Plus applicable sales tax and freight if ordering directly from Microsoft. Offer good only in the 50 United States (800) 563-9048; outside the United States and Canada, call (206) 936-8661. Microsoft and PowerPoint are registered trademarks and Windows is a trademark of the Microsoft Corporation. Macintosh Presents are registered trademarks of Cricket Software. Symantec MORE is a trademark of Symantec Corp. Installation of PowerPoint version 3.0 for the Macintosh requires System 7 to run.

Expander can attach 49 SCSI devices to a CPU

By Kirsten L. Parkinson

Amherst, N.Y. — ATTO Technology Inc. next month will ship SCSI Expander, a hardware device that makes it possible for users to attach as many as 49 SCSI devices to a single CPU.

Users can connect seven SCSI Expanders

to their Macs. Each Expander in turn can support as many as seven peripheral devices, including hard drives, CD-ROM drives and removable-media drives.

The SCSI Expander handles the additional drives by reading each peripheral's logical unit number, which is part of the SCSI specification. Each device is then identified by the Expander's SCSI ID and its own ID, which acts as a subaddress.

Other features of the SCSI Expander include active SCSI termination, staggered device spin-up and edge-to-edge parity support.

The SCSI Expander comes either as an external device or as an internal 3.5-inch device.

Prices for the SCSI Expander range from \$995 to \$1,195, depending on SCSI configuration. Differential and single-ended versions are available; differential SCSI features reduce noise on the SCSI bus and support cable lengths up to 81 feet.

ATTO Technology Inc. is at Baird Research Park, 1576 Sweet Home Road, Amherst, N.Y. 14228. Phone (716) 688-4259; fax (716) 636-3630. □



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New Windows player runs Director 3.1 files

San Francisco — Users can run Macromedia Director 3.1 productions on IBM PCs and compatibles with a Windows player released this month.

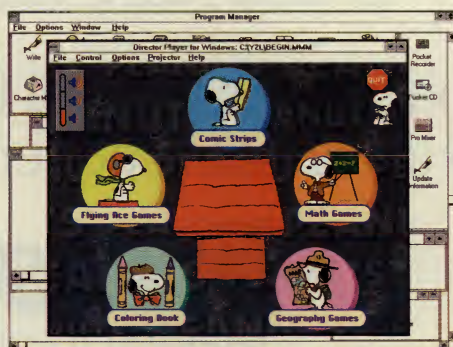
Macromedia Inc. is offering Director 3.1 Player for Windows for \$995. The package lets developers translate, play and distribute Mac-created productions under Windows 3.1. It comes with a Mac-to-PC conversion utility and a PC runtime module.

The previous release of the player, Version 1.2, supported files created with Director 3.0 but not 3.1. In addition to solving that problem, the new player adds support for QuickTime and Microsoft Corp.'s Video for Windows. It uses Windows Media Control Interface to control external devices.

Player upgrades are \$199 or free to users who purchased Version 1.2 this year.

Macromedia said it is also offering a \$15 bug-fix upgrade to the Mac version of the Director 3.1 application.

Macromedia Inc. is at 600 Townsend St., San Francisco, Calif. 94103. Phone (415) 442-0200; fax (415) 442-0190. □



Macromedia's Director 3.1 Player for Windows package converts Macintosh-created productions and plays them on Windows machines.

Corkboard's index cards, outlines let users graphically organize ideas

By Neil McManus

Santa Monica, Calif. — MacToolkit next month will post a new idea processor that uses the metaphor of index cards on a cork board for organizing ideas.

Priced at \$299, Corkboard is designed for writers who want to organize notes into outlines, finished reports or screenplays.

Users enter notes, pictures and QuickTime movies into on-screen index cards that can be grouped into card files. When a user double-clicks on a card file, the program displays the

cards on a cork-board window, where they can be arranged by categories.

The cork-board window offers free-form, vertical and horizontal displays. Users can change text, styles and color on cards and edit and delete them at any time. Cards can be grouped into hierarchies; when a card is moved, its subordinates move with it.

Users can change a cork board's background pattern or zoom out on a cork board to show more cards.

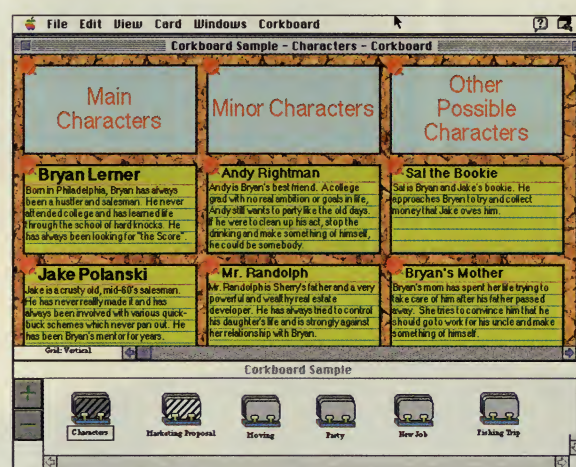
In addition, users can display their cards in an outline view. Cards can be edited and rearranged in outlines, and users can show or hide card detail.

The program offers a print-preview mode that lets users make layout modifications.

MacToolkit said a free upgrade to Corkboard due this summer will add databaselike find, sort, search and select controls.

Corkboard can export cards and outlines to text files or to Final Draft 2.0, MacToolkit's \$349 scriptwriting program.

MacToolkit is at 1234 Sixth St., Suite 204, Santa Monica, Calif. 90401. Phone (310) 395-4242; fax (310) 393-7747. □



MacToolkit's Corkboard lets users organize notes on index cards on a cork board. Users can change text, styles and color on cards and group them into card files along the bottom of the screen.

Radius program offers on-site replacement

*Worry Free warranty
promises 24-hour service*

By Neil McManus

San Jose, Calif. — Starting this week Radius Inc. will send representatives to customer sites to pick up and replace defective hardware.

The Radius Worry Free warranty program promises to provide on-site equipment replacement within 24 hours of a customer's initial service call.

For example, if a user calls customer support to report a defective monitor, the company will immediately send a replacement monitor by overnight delivery, according to Ken Williams, Radius vice president of customer service. A Radius representative will call the user to make an appointment for the next day to install the new monitor and box and remove the defective unit.

"Our customers have told us that they need replacement equipment right away instead of waiting three or four days to get it through a dealer," Williams said. "This program will get their equipment up and running fast, and they won't have to call a chiropractor after trying to move a monitor."

Radius is implementing the Worry Free program immediately in the United States. It will be extended to Canada and Mexico this summer, Williams said.

Most Radius monitors, graphics cards and accelerator boards carry a one-year warranty. Radius is considering another program that will let users purchase extensions to product warranties in one-year increments, Williams said. □

Orchestra monitors available

Fontana, Calif. — Hoping that users will like the sound of its latest offerings, Orchestra MultiSystems Inc. is now selling two new monitors previously available only to OEM customers.

Orchestra's Brass series contains two Mac-compatible color monitors, the \$545 15-inch French Horn and the \$945 17-inch Tuba. Orchestra said it will offer versions of the two monitors that conform to Swedish safety standards for extremely low frequency and very low frequency emissions. Prices have not been set.

Both monitors support resolutions from 640 by 480 pixels to 1,280 by 1,024 pixels. Screen-refresh rates range from 70 Hz to 72 Hz. Both displays offer tilt-and-swivel bases and non-Sony-built Trinitron flat screens with a dot pitch of 0.28 millimeters. Front-panel digital controls give users access to image and screen adjustments.

Orchestra MultiSystems Inc. is at 10881 Business Drive, Fontana, Calif. 92335. Phone (909) 357-6869; fax (909) 357-6876. □

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MPW 3.3 released through APDA

By Raines Cohen

Cupertino, Calif. — Apple this month shipped an update to its Mac software-development environment, Macintosh Programmer's Workshop.

MPW 3.3, distributed widely in prerelease form over the past year, is now officially

released through APDA, Apple's developer-tools marketing arm. New features in the multilingual environment include:

► **Incremental linker.** The new version can build programs much faster than before by relinking only changed portions of code rather than entire projects at a time.

► **Improved documentation.** The manuals have been rewritten and now include a step-by-step tutorial with hands-on examples.

► **Distributed processing.** Two new applications in the environment, ToolServer and SourceServer, use custom Apple events to trigger scripts and tools on MPW running in the background on multiple Macs. Developers can distribute slow tasks among multiple Macs.

► **Interface enhancements.** The Projector project-management and source-code

control dialogs and others now include keyboard navigation.

MPW 3.3 is also faster and more reliable than previous versions, according to Apple.

The MPW Development System 3.3 sells for \$250 on a CD-ROM or \$300 on floppy disks. Users can upgrade for \$100 on CD-ROM or \$125 on floppies.

APDA is at P.O. Box 319, Buffalo, N.Y. 14207-0319. Phone (716) 871-6555 or (800) 282-2732; fax (716) 871-6511. □

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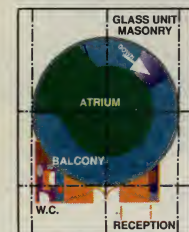
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Canon

Applied gives a boost to SE accelerator card

By Carolyn Said

Dallas — Want to rev up that old SE? Applied Engineering this month shipped a 68030 accelerator/multifunction expansion card for Mac SEs.

Applied said the TransWarp 1300 boosts performance as much as 12 times faster than the standard SE. A 25-MHz model sells for an introductory price of \$199. The company said the price will rise to \$229 at an undetermined date. With an optional FPU (floating-point unit) the 25-MHz model costs \$338.

A 40-MHz TransWarp 1300 is \$279. With an FPU, it is \$428; with a 128-Kbyte cache, \$428; and with both cache and FPU, \$577.

The 40-MHz model has four SIMM slots that accept 1-, 2- and 4-Mbyte SIMMs.

The TransWarp 1300 also offers video expansion and Ethernet support. It comes with a MagicBus connector that supports Radius full-page and two-page displays. In late June, Applied will offer a video add-on card that supports most full-page and two-page displays.

An Ethernet adapter board and another that includes both Ethernet and expanded video are also due in June. Pricing for all the expansion options has not been set.

The accelerator has a three-year warranty.

Applied Engineering, a division of AE Research Corp., is at 3210 Beltline, Dallas, Texas 75234. Phone (214) 241-6060 or (800) 554-6227; fax (214) 484-1365. □

Pro-Cite add-on upgraded

By Ian G. Jacobs

Ann Arbor, Mich. — Personal Bibliographic Software Inc. this month will ship an update to its data transfer programs that consolidates all of the modules, formerly sold separately, into a single package.

Biblio-Link II, a companion to the company's \$395 Pro-Cite bibliographic formatter, does the work of all three previous Biblio-Links by importing data from searches on the Dialog, SilverPlatter and Medlars databases into Pro-Cite.

Now users will be able to customize the program to analyze data from in-house databases. The new version can also print reports of configuration file settings and an error log of problems it encounters while downloading.

The program's price has been cut to \$195 from \$295. Upgrades are \$45 until June 30 and \$65 thereafter.

Personal Bibliographic Software Inc. is at P.O. Box 4250, Ann Arbor, Mich. 48106-4250. Phone (313) 996-1580; fax (313) 996-4672. □

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Single Source, ETC set to ship large-screen color monitors

Offer digital controls to handle images

By Nathalie Welch

San Francisco — Two new large-screen color monitors are due to hit the market next month.

► **ViewSonic.** Single Source Marketing will ship the 21-inch ViewSonic for \$2,499.

The flat, square-screen monitor has a dot pitch of 0.26 millimeters and supports resolutions ranging from 640 by 480 pixels with a 76-Hz screen refresh rate to 1,152 by 870 pixels with a 60-Hz screen refresh.

The ViewSonic conforms to Swedish safety standards for extremely low frequency and very low frequency emissions, according to Single Source.

► **ViewMagic.** A new player in the market, ETC Computer Inc., will ship its 17-inch, ViewMagic CA-1765 monitor for \$1,199.

The flat, square-screen monitor has a dot pitch of 0.26 millimeters and supports resolutions ranging from 640 by 480 pixels with a 72-Hz screen refresh rate to 1,280 by 1,024 pixels with a 60-Hz screen refresh.

ETC said the "smart" monitor automatically memorizes adjustments to user-definable settings for multimode video cards.

Both monitors offer front-panel digital controls for image size and position, pincushion and degauss.

Both displays offer tilt-and-swivel bases, nonglare screens, and compatibility with a variety of Apple and third-party graphics cards. Both displays require adapters, which are supplied by the manufacturers.

Single Source Marketing is at 2550 Mesa Verde Drive E., Suite G, Costa Mesa, Calif. 92626. Phone (714) 545-1338; fax (714) 545-5371.

ETC Computer Inc. is at 46711 Fremont Blvd., Fremont, Calif. 94538. Phone (510) 226-6250; fax (510) 226-6252. □

MacHealth adds charts to patient records

By Ian G. Jacobs

Lincoln, Neb. — HealthCare Communications Inc. last week shipped new versions of its MacHealth line of medical-office-manager programs that now allows medical practitioners to add clinical information, including charts and photos, to patient records.

The programs, DentalMac, MediMac and ChiroMac, manage scheduling, accounts receivable, electronic insurance processing and more. Some of the programs are also available in high-end versions that support image acquisition and voice-activated charting.

MacHealth Version 3.9 programs include a Patient Information Matrix, an electronic flow chart that can be used to monitor patient progress.

A new tool, Patient Narrative, rapidly retrieves and inserts commonly used text and graphics in the program's new built-in word processor module with a medical spelling checker.

"I often write letters to patients and keep a copy of [them] in their records," said Anne Ephraim, a



MediMac F/X allows users to make QuickTime movies from medical images and include them in patient records.

MediMac beta tester and office manager of Westchester Urological Associates of White Plains, N.Y.

MediMac is priced at \$4,295 for a single-user version and \$5,895 for a network version. Prices vary for the other versions.

HealthCare Communications also released a high-end version of MediMac that can capture, record and enhance digitized images from radiographs, echocardiograms and other medical monitoring devices with video output and a QuickTime-compatible digitizer or a Kodak

Photo CD disc. MediMac F/X, sold only in a \$7,495 multi-user networked system, includes an image editor that lets users annotate acquired images.

The F/X version includes a medications reference database of 3,000 FDA-approved substances that doctors can prescribe and track, plus an electronic insurance claims module.

HealthCare Communications Inc. is at 300 S. 68th St., Suite 100, Lincoln, Neb. 68505-5846. Phone (402) 489-0391 or (800) 888-4344; fax (402) 489-6411. □

**IF YOU'RE NOT
IN BOSTON
A DAY EARLY,
IT WILL BE
TOO LATE.**



Macintosh Volume Buyers

PRODUCT DEMO

**Copley Plaza Hotel, Boston,
August 2, the day before
the Macworld show opens.**

MacWEEK readers are busy. Sure, you always make time to see the latest products at the industry shows, but it's exhausting to wade through the crowds. It takes too much time searching for someone who can answer important questions about product features, system requirements, service availability, pricing.

Or, there is MacWEEK's annual MVB event in Boston. The MVB show is designed to give a limited number of MacWEEK readers the opportunity to get a close look at the latest products for the Macintosh. The most innovative Macintosh vendors will be there to demonstrate products and answer questions.

The MacWEEK MVB event will be held in Boston on August 2nd, the day before the Macworld show. The product exhibition hours are 1:30 to 4 pm, all guests are eligible for our product drawing.

The MacWEEK MVB event is the opportunity for you to make the most of your time in Boston. To reserve a ticket, please complete the form and fax it to the number indicated. Complete schedule and exact location information will be sent with your confirmation.

PLEASE FAX TO: (415) 243-3650

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone () _____ Fax () _____

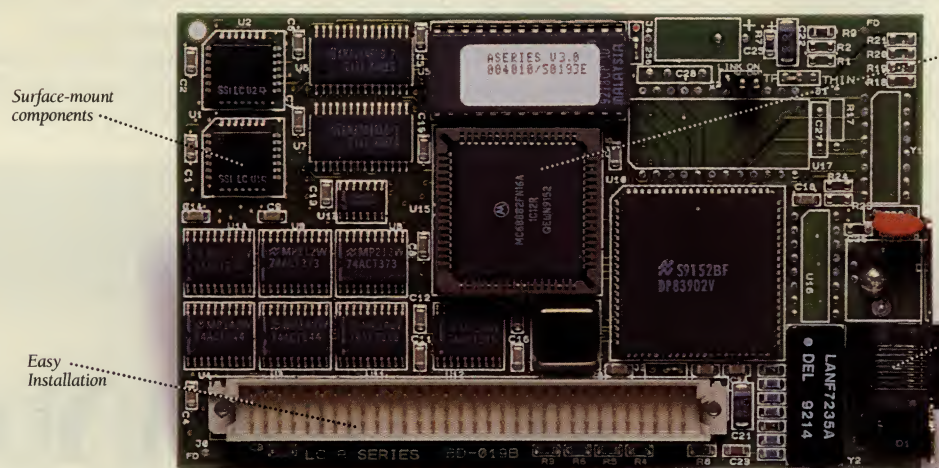
How long have you been a MacWEEK subscriber? _____

Have you attended a MacWEEK MVB event before? _____

How many Macs are at your site? _____

Which products or vendors are you most interested in seeing? _____

EtherLAN™

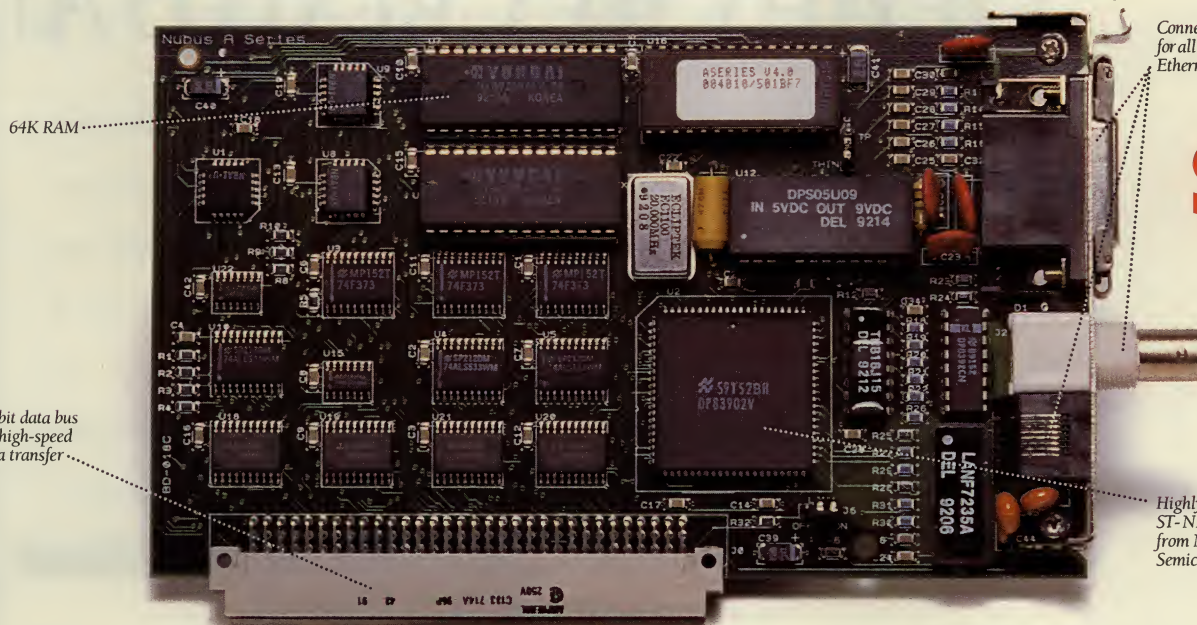


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ETHERNET
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thin or 10BaseT,
FPU socket, 16K RAM

EtherLAN™ LC-T
Product # 60 3100



\$14999

NuBus with 64K RAM
Thick, Thin, and 10BaseT

EtherLAN™ A1-II
Product # 60 3600



Make the right choice with 3-in-1 boards

Thick, Thin, and 10BaseT—tomorrow's topology needs require flexible solutions.

When you make the decision to invest in Ethernet, invest in the best technology for the job. Our new 3-way EtherLAN boards give you the advantage of instantly changing to the topology of choice—whether it's thick, thin, or 10BaseT.

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- **FPU sockets for expandability**
- **3-way boards: Thick, Thin, and 10BaseT**
- **Lifetime Product Warranty**
- **Pass-Thru Slot boards for SE/30 and IIsi**

EtherLAN is the smart buyers alternative to expensive Ethernet cards. And this is state-of-the-art Ethernet, with features found only on the best boards. Compare with Asanté and Farallon—we have the best value.

The Best Value

Ethernet Board	EtherLAN	Asanté	Savings
SE, SE/30, IIsi 3-way*	\$169.99	\$249	\$ 79
SE/30, IIsi Pass Thru**	\$169.99	\$329	\$ 159
Mac II NuBus ***	\$ 99.99	\$249	\$ 149
Mac II 3-way *	\$149.99	\$329	\$ 179
LCT/FPU 10BaseT	\$169.99	\$399	\$ 229
LC 2-way, FPU, 64K	\$199.99	\$479	\$ 279
EtherLAN SC (SCSI)	\$199.99	\$399	\$ 199
EtherLAN HUB 8	\$199.99	\$399	\$ 199

* Thick, Thin, & 10BaseT— all on one board
** Pass Thru Slot- allows second PDS board
*** 16K, Thick and Thin OR Thick and 10BaseT

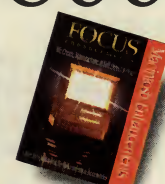
24 Quality Ethernet Solutions to choose from

Focus EtherLAN SC provides Ethernet through your SCSI port. Fully compatible with Thick, Thin, or 10BaseT, the EtherLAN SC is a convenient plug and play solution for all Macs.

Focus EtherLAN 8-Port HUB for 10BaseT with Thin connector, now available. Stop wasting your time and money with overpriced Ethernet cards— order your EtherLAN today.

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Dynaware imports Japanese word processor, input app

By Lisa Picarille

Foster City, Calif. — Dynaware USA Inc. last month brought to the United States a WorldScript-compatible Japanese word processor and a Kanji Input Method extension.

The word processor, called MacWORD 2.0, can arrange lines of characters vertically rather than horizontally as they are entered, to support the traditional Japanese character layout. (According to the company, MacWORD is the only program to do so.)

The \$480 program offers features common to many word processing packages, including the capability to import charts and graphics as well as images in PICT and Encapsulated PostScript formats, and support for System 7's publish and subscribe. MacWORD also offers layout and publishing features and can perform mail merges.

The company both bundles with MacWORD and sells separately for \$180 MacVJE γ 1.0, an input method billed as an alternative to Apple's Kotoeri.

Famous Engineer draws new technical characters

Richmond, Va. — From $\pi \approx 3.14$ to $\Sigma x^2 = \Pi y$, users looking to get their chemical and mathematical formulas just right can turn to a new font from Famous Engineer Brand Software Co.

FEBTechnical, available in TrueType and PostScript Type 1 formats, provides more than 200 scientific characters. These include lowercase Greek letters; subscripts and superscripts; common math symbols; chemical formula notation; graphing symbols; and engineering characters, such as vector notation and overbars.

Users can also create any fraction using the typeface's built-in fraction slash mark and superscript and subscript characters.

FEBTechnical is priced at \$59.95 (\$49.95 through the end of July).

Famous Engineer Brand Software Co. is at 4855 Finlay St., Richmond, Va. 23231. Phone (804) 222-2215; fax (804) 226-1934. □

Silentwriter rebate extended

Boxborough, Mass. — NEC Technologies Inc. has announced that it will continue through the end of June its \$250 rebate on four Silentwriter printer models.

The printers included in the program, originally set to expire May 1, are the Model 95, 95fx, 97 and 97fx, priced at \$1,320 to \$1,850.

The Silentwriters are all 300-dpi laser printers that automatically switch among LocalTalk, serial and parallel interfaces. The fx printers include a PostScript fax feature.

NEC Technologies Inc. is at 1414 Massachusetts Ave., Boxborough, Mass. 01719-2298. Phone (508) 264-8000 or (800) 388-8888; fax (800) 366-0476. □

Like Kotoeri, MacVJE γ lets users build kanji words by entering phonetic equivalents; it then looks up corresponding kanji words in a dictionary.

Users can teach MacVJE γ new words to expand its 120,000-word dictionary up to 170,000 words; Kotoeri's dictionary is

limited to less than 60,000 words.

Users can choose whether menus appear in English or Japanese. Both require System 7.1 and the WorldScript II extension in the Japanese Language Kit. The programs are aimed at Japanese-speaking users in the United States, as well as U.S. companies that

need to create Japanese documents.

Through the end of June, Dynaware is offering MacWORD 2.0 for \$350. Users of other Mac-based Japanese word processors can get the program for \$200.

Dynaware USA's parent company, Dynaware of Osaka, Japan, shipped MacWORD 2.0 in Japan in January.

Dynaware USA Inc. is at 950 Tower Lane, Suite 1150, Foster City, Calif. 94404. Phone (415) 349-5700; fax (415) 349-5879. □

THIS SHOULD GIVE YOU OF WHY WE CREATED AN

The image you see over there started out attached to the image you see over here. But as this document made its way down to the printer, the Macintosh it was created on recognized a small problem: 11 x 17 pages can't fit through 8½ x 11 printers.

And so, out came the electronic scissors.

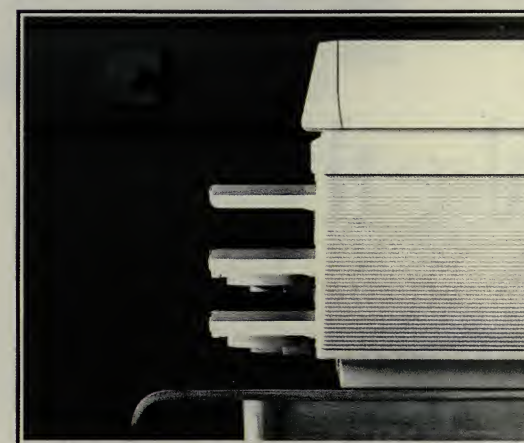
COMPAQ PAGEMARQ Laser Printers. A line of

paper trays, these printers also let you switch between paper sizes without ever leaving your desk. So you don't have to pull one paper tray out and replace it

Now, if you're like many Macintosh users, you know all about this routine. And you know how it feels to walk into a meeting with a layout that contains hours of blood, sweat and tears,

and a fat strip of tape right down the middle. Enough said.

Introducing the new



machines that can print 11 x 17 pages in a single pass. And because they come with up to three

with another, only to have your neighbor repeat the process two minutes later. And for

*This service, provided by contract service providers, is specific to hardware products and may not be available in certain geographic locations. Consult the Compaq Customer Support Center for further details. ©1992 Compaq Computer Corporation. All Rights Reserved.

Clarify systems enhance controls for service, support staff

By Lisa Picarille

San Jose, Calif. — Clarify Inc. has added new tools for managing service and support and extracting data to two applications in its Customer Service Management System.

The CSM system is aimed at organizations that field multiple customer calls per day, such

as technical support and corporate help desks.

► **ClearSupport** gives technical-support personnel on-line access to a database of information and responses to previously diagnosed problems. Version 2.0 now lets users generate reports on the number of times a certain problem or enhancement has been reported or

requested. It adds an "uptime monitor," which automatically alerts administrators or Clarify tech support before problems occur, and new facilities for tracking product serial numbers. Other enhancements include additional printing capabilities and a tutorial.

► **ClearQuality** records product-defect

information. Version 2.0 lets users generate more-detailed defect reports, including the rate of fixing and other statistics on the amount and types of defects found. The update can also identify duplicate defects and includes printing and reporting enhancements.

Both products now let managers easily define and change the system's "business rules" to keep in step with an organization's procedure changes, and track on-site time and expenses.

In addition to client applications, such as ClearSupport and ClearQuality, CSM includes Clarify Desktop, which provides a common interface across Mac, Unix and Windows platforms with facilities for electronic-mail and automatic call distribution; and a server-based database for storing customer and product data.

Upgrades to both applications are free. ClearSupport 2.0 costs \$6,000 per concurrent user, and ClearQuality 2.0 is \$4,000 per concurrent user.

Clarify Inc. is at 2702 Orchard Parkway, San Jose, Calif. 95134. Phone (408) 428-2000; fax (408) 428-0633. □

A PRETTY GOOD IDEA 11 X 17 LASER PRINTER.

people whose design ambitions extend beyond Helvetica Bold, Pagemarq Printers offer two ways to expand your type library, eliminating the need to Modules, and store as many as 40 additional fonts. Or you can add an internal 60-MB Hard Drive, and store everything from Avant Garde to Zapf Chancery—as many as 1,500 fonts. Laser Printers are fully backed by CompaqCare, our extensive service and support program. Which includes a one-year, on-site* limited warranty as well as unlimited phone support.

All of which print with amazing clarity thanks to the 800x400 dpi high-resolution mode—a feature that delivers razor-sharp type and graphics as well as smooth, high-definition gray scales. Of course, the new COMPAQ Pagemarq

We'll show you how to keep your big ideas in one piece. At least until your client sees them.



A typographer's dream, these printers can store 1,500 fonts. Of course, not all of us dream about type. In which case, the 35 fonts that come standard are more than adequate.

Send Fax

Add an Internal FAX Modem and you can turn your Mac into a personal fax machine. One that will send and receive PostScript quality faxes in any size up to 11x17.



continually download from your Macintosh. You can add 1- and 2-MB Programmable Font

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Registry upgrade fleshes out details in Mac app DB

By Ian G. Jacobs

Bronxville, N.Y. — Mac Software Registry last month shipped an update to its database of Macintosh software that now tracks the version history of each listed program.

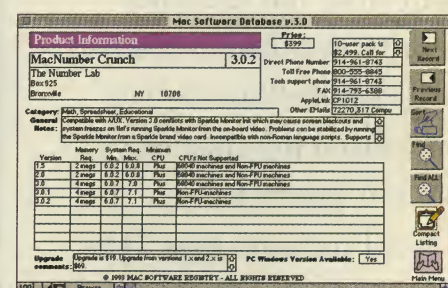
The Mac Software Database, which requires Claris Corp.'s FileMaker Pro 2.0, lists more than 2,200 products from more than 800 companies, including updated contact and compatibility information for each company and product.

Version 3.1, which shipped last week, has a new format that shows for each product a table containing the version number, memory, compatible system versions and Mac models supported. The information in the database has been updated.

Users can now log the serial numbers and number of copies licensed for each program, as well as which users have copies.

The \$199 price includes the database and three quarterly updates. Annual subscription renewals cost \$129.

Mac Software Registry is at P.O. Box 925, Bronxville, N.Y. 10708-0925. Phone (914) 961-8743; fax (914) 793-6388. □



Mac Software Registry's Mac Software Database now tracks the version history of listed products, and it logs system and CPU compatibility.

In a new, independent lab test, the 24-bit color graphics card most people think of as fastest, wasn't.

Ingram Laboratories ran a Hydra QuickDraw™ performance test and found Radius' PrecisionColor 24X™ was 19% faster overall than the Thunder/24™.

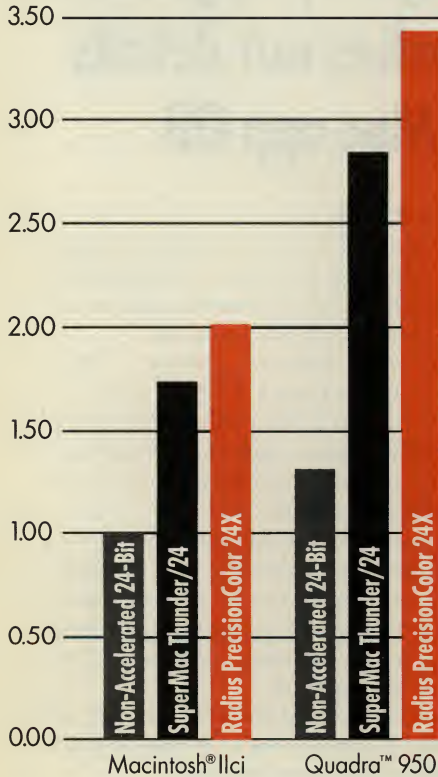
That's surprising, especially since the makers of Thunder/24 want you to pay \$1,250 more for their card.

PrecisionColor 24X isn't just faster and less expensive. It's also available in 7" and 9" versions.

So it will fit in all of Apple's newly-announced systems, as well as current models.

No wonder MacUser rated PrecisionColor 24X "Best Price/Performance." And both MacWorld and Byte named it their "Readers' Choice."

Hydra QuickDraw Performance Test
Overall Performance



Call us at 1-800-227-2795 Ext. 2A for your \$100 rebate certificate, copies of the benchmarks and the name of your nearest Radius reseller. Or call 1-800-966-7360 to receive faxed information about our products.

Get PrecisionColor 24X. Lightning fast performance. Priced to strike you right.

If This Independent Test Doesn't Astonish You, The Cost Difference Should Leave You Thunderstruck.

PRECISIONCOLOR 24X
radius™



Law Office Manager 3.0 offers automated reminders, hot links

By Ian G. Jacobs

Knoxville, Tenn. — Avocat Systems Ltd. recently released a major upgrade to its legal case management software.

Law Office Manager 3.0 adds Automatic Ticklers that notify lawyers of important filing and follow-up dates, which are set in place once an initial filing date has been entered for a case.

Version 3.0 allows hot links between a viewing icon and any document, making document management easier.

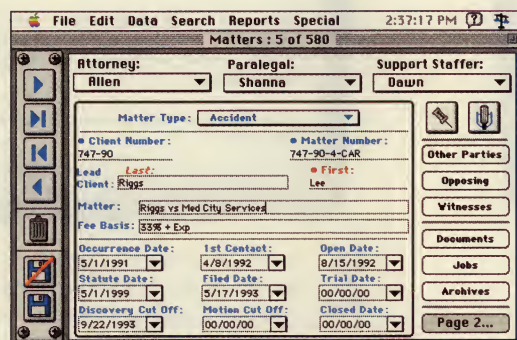
A new Other-Parties feature lets users store information on people related only peripherally to a case.

The program's calendar can now export information to TimeSlips Corp.'s TimeSlips and to Essential Software Inc.'s Easy Alarms (see MacWEEK, Jan. 18).

The speed of the data-entry screens has been increased by 30 percent, according to Avocat, and 45 new entry fields have been added.

The built-in word processor allows users to merge all information pertaining to a case from the program's databases into a single document.

Other new features include faster and



Law Office Manager 3.0 features automated reminders at the bottom of the screen. The reminders are set in place when an initial filing date is entered for a case.

more-accurate conflict checking and the capability to assign multiple people (for instance, an attorney, a paralegal and a staffer) to a particular matter.

A single-user version is \$899, a five-user pack is \$1,495, and a 10-user pack is \$2,195. Additional users are \$199 each. Upgrades are free.

Avocat Systems Ltd. is at 1402 Riverview Tower, Knoxville, Tenn. 37902. Phone (615) 523-9270 or (800) 521-6588; fax (615) 637-8810. □

MIFP app turns any PICT into a ScreenSaver

Module works as an add-on to After Dark, Intermission

By Henry Norr

Portland, Ore. — ScreenSaver, a screen-saver module from MIFP Development, now lets users savor any PICT image from any mounted volume when their computers are idle.

The \$49.95 product, an add-on to Berkeley Systems Inc.'s After Dark or ICOM Simulations Inc.'s Intermission, was originally designed to display high-resolution photographic images distributed by MIFP as screen savers (see MacWEEK, Nov. 9, 1992). But Version 2.0.1, released last month, lets users select any PICT file for display during idle

time. In addition, the new version can display images stored on CD-ROMs, remote volumes or file servers; users need only to place an alias of the image in their ScreenSaver folder.

A new Collage mode lets users divide their screen space among multiple images in a variety of sizes; the full-screen and quartile options of the original version also remain available. Other enhancements in the upgrade include several new effects for transitions between images, including jigsaw, venetian-blind and wallpaper effects.

Upgrades are free to anyone who purchased ScreenSaver after Jan. 1; for others, the cost is \$15.

MIFP now offers more than 20 optional image sets, each containing a dozen 24-bit-color photographic images compressed via QuickTime. Each is priced at \$39.95. The two latest additions to the series are Fairways to Savor, a collection of aerial photos of golf courses, and Kittens on Vacation, a set of images of cats at various scenic locations.

ScreenSaver 3.0, due next month, will not require After Dark or Intermission; in addition to the current add-on modules, the next version will include a stand-alone screen-saver application, according to MIFP. Upgrades from Version 2.0.1 will be free.

MIFP Development is at 7276 Beaverton-Hillsdale Highway, Suite 187, Portland, Ore. 97225. Phone (503) 292-0362 or (800) 697-6437; fax (503) 292-0041. □



MIFP Development's ScreenSaver lets users turn high-resolution photos into screen-saver images. Version 2.0.1 also lets users divide their screens among multiple images.

Our New Policy Guarantees Overnight Success.

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Radius products are engineered to never, ever fail.

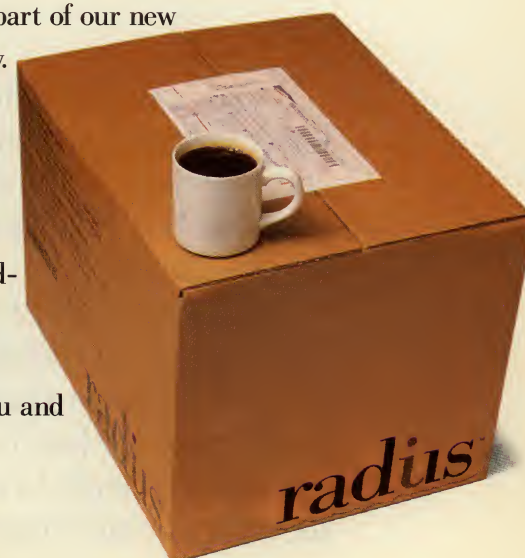
But should the impossible ever happen, we'll make it right, overnight.

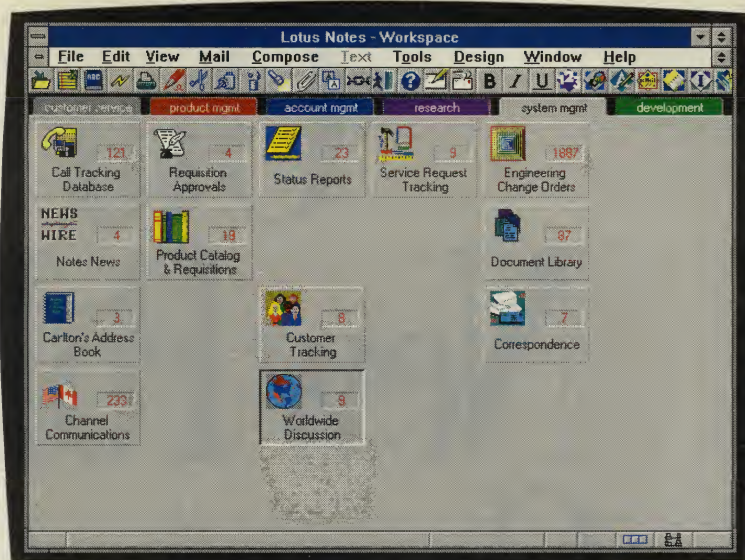
Just call our customer service department, (408) 434-1012 by 9:00 p.m. EST and we'll deliver a Radius replacement product to you overnight. Within hours after that, a Radius representative will also be there to pick up your failed product. If it's a monitor we're replacing, our representative will even unpack and install it for you.

You pay nothing extra for this extra service. That's right, absolutely nothing. It's all part of our new 1-year Worry-Free Warranty.

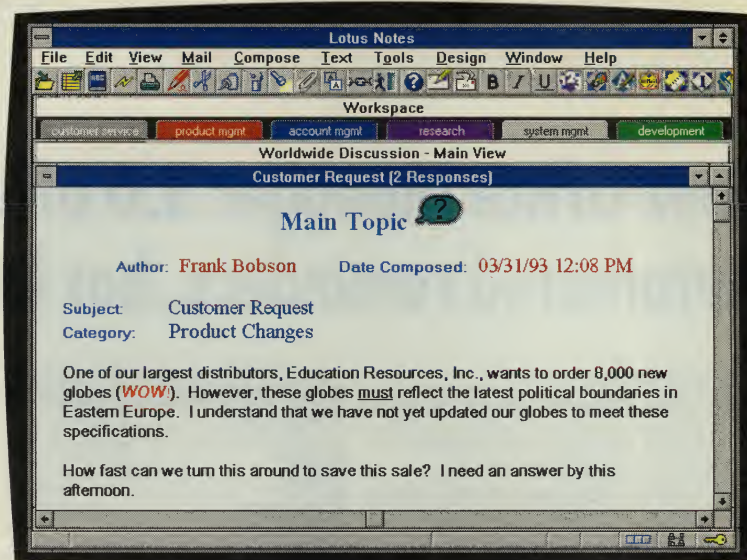
Call 1-800-227-2795 Ext. 8A for more information about this great new service. Or to receive faxed information about our products call 1-800-966-7360.

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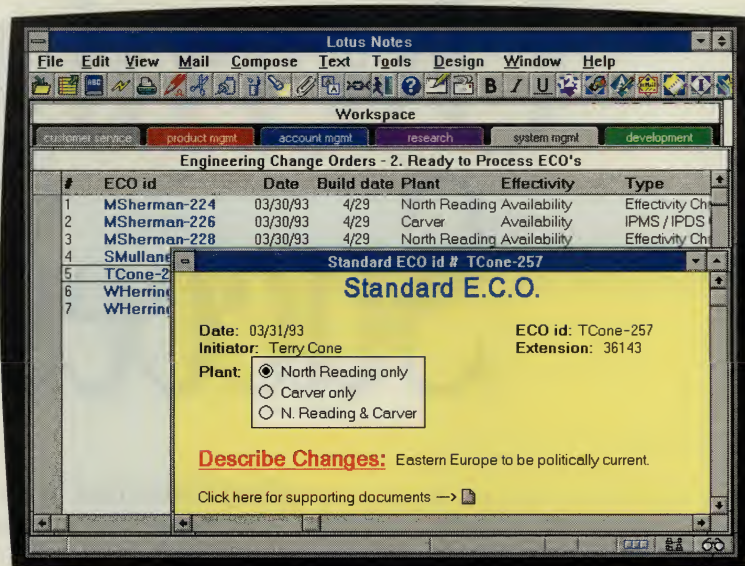




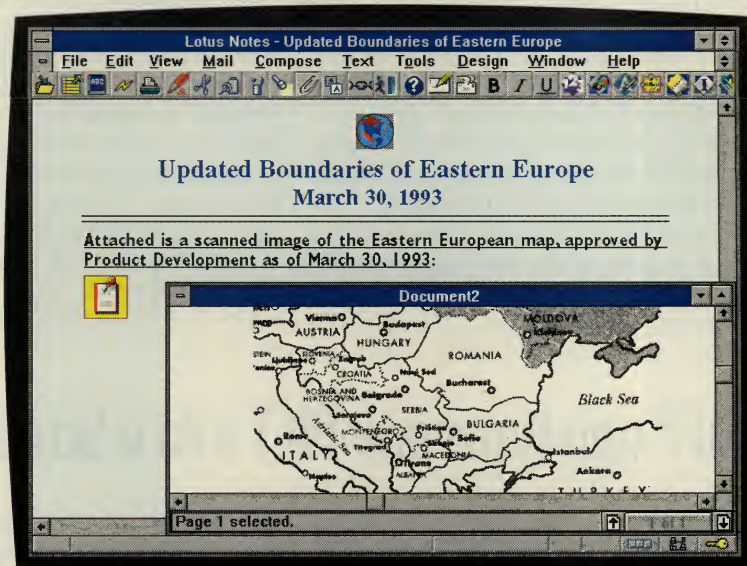
1. This is James' Notes desktop. He uses it to access information and work quickly with people in all departments to solve problems world-wide. James clicks on the Worldwide Discussion application to catch up with important company news. The SmartIcons across the top make it even easier to work in Notes.



2. The field rep in Texas is working on a request from a customer. But to make the sale, the product, in this case a globe, has to be changed to reflect the most up-to-date countries and borders. And evidently time is critical. The competition must already be in there pitching.



5. Once he has the information, he clicks on the Engineering Change Order application to request specific product changes from the plant in North Reading. He links the supporting Newswire information to the E.C.O. It will be easily viewed with a single click of a button.



6. After lunch he opens a document from Ellen, in product development, who has responded with the necessary changes, and scheduling information. The new art was scanned directly through Lotus Notes: Document Imaging from the art department. James approves the art for manufacturing.

How Lotus Notes Releases

Thousands of companies already know how Lotus Notes helps them respond more quickly and effectively to the demands of everyday business. Now Release 3 extends that power to new dimensions.

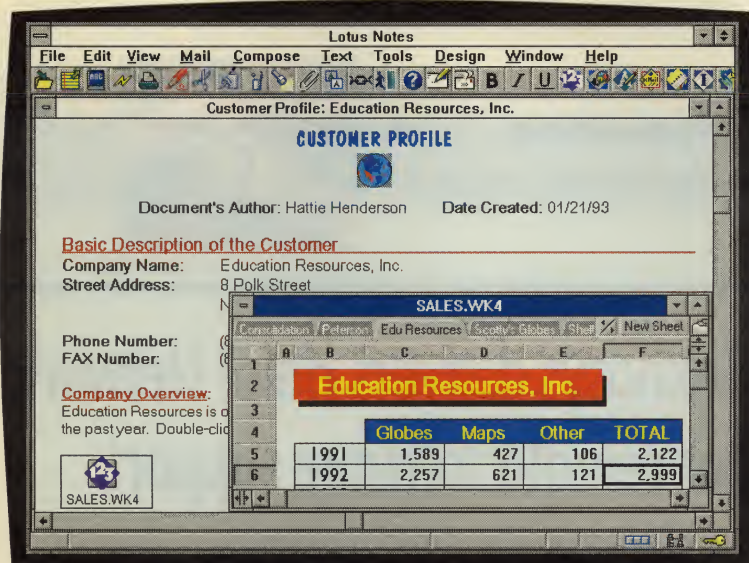
Just watch how James Carlton, a new district manager at Global Publishing, uses Notes Release 3 to solve a major global problem in short order. See how he uses information from on-site and remote locations. From both inside the company and external sources. Across a



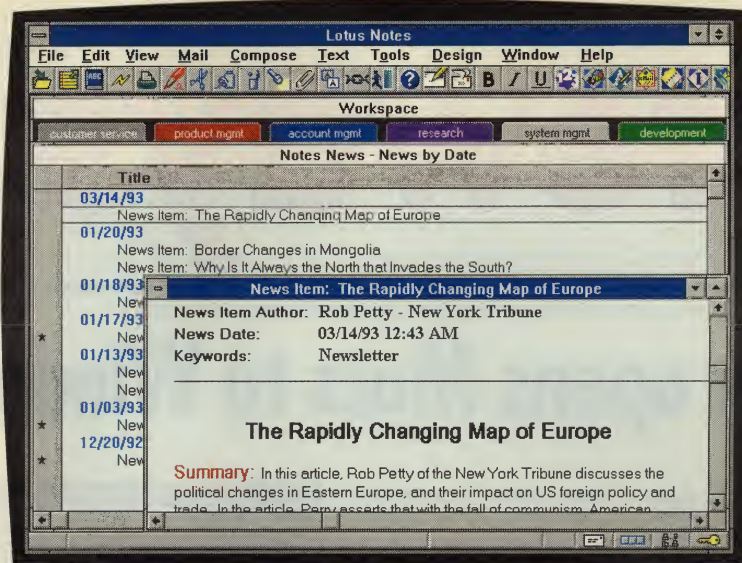
variety of platforms. How he uses applications such as Account Tracking, Newswire, and Engineering Change Orders to get a new product developed fast. And how he creates an informal team spanning a range of departments to do it.

With the new Release 3, Lotus® Notes now supports all the leading GUI platforms: Windows; OS/2; UNIX;* even Macintosh®.

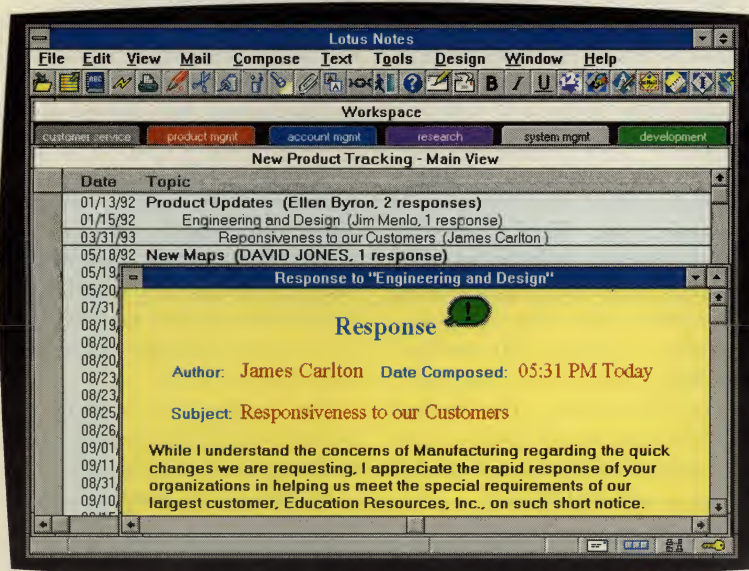
Which means the award-winning workgroup power of Lotus Notes® is now readily available to help virtually all networked businesses improve



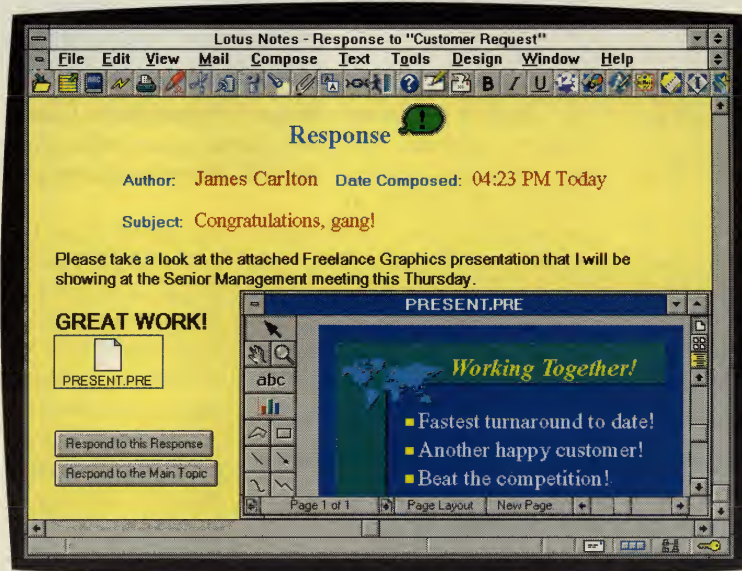
3. He clicks on the Customer Tracking application to learn more about this customer. The profile includes an attached 1-2-3® spreadsheet. He double clicks the icon to open the spreadsheet and finds that Education Resources is a very large customer that pays its bills.



4. James' next step is to click on the Newswire database for the most up-to-date report on precisely what geographical changes will have to be made on the new globe. And just how extensive they'll be.



7. On the Product Tracking application, all departments involved have confirmed that they can meet the schedule. However, they've cautioned James to be careful about rushing schedules in the future. James uses the Discussion database to acknowledge their comments and thank them for their efforts.



8. Wanting to record and promote the team's accomplishments, James puts together a presentation for senior management in Freelance Graphics. Then he posts the presentation in the Presentation database so everyone can see how the team rearranged the world to save a big account.

Release 3 changed the world.

their performance. By accelerating business processes and helping people work together more effectively than ever before.

You'll find your favorite user-friendly features from other Lotus applications like SmartIcons™ and a status bar make Notes even easier to use.

Release 3 also features enhanced templates that are very easy to customize so you can build new applications faster and more efficiently.

But you don't have to change your world to get going on Notes. Now you can get everything you need in the

Lotus Notes Starter Pack for just \$995 (SRP). It includes one Notes Server for Windows and two Notes Clients for Windows. Plus more than 25 ready-to-use applications for business processes like account management, customer service and product development. For information call **1-800-828-7086, ext. 8884** or visit your Lotus Authorized Reseller or Lotus Business Partner.

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Lotus Notes



Miramar opens Macs to Windows

MacLan Connect lets PCs share Mac files

By April Streeter

Santa Barbara, Calif. — Miramar Systems Inc. this week is shipping software that lets a Windows user become a peer on a Macintosh network, sharing files and printers.

The \$199 Personal MacLan Connect for Windows runs on Intel-standard 386 or 486 machines with Microsoft Windows 3.1. Windows users share files with Macs in a manner similar to that of two Macs using System 7's file sharing.

The Windows user selects specific directories to share and assigns passwords to individuals or groups. Multiple Macs can access the MacLan Connect Windows machine simultaneously through their Choosers.

MacLan Connect differs slightly

from other peer-to-peer solutions such as Farallon Computing Inc.'s Timbuktu, which allows screen sharing and file exchange between one Mac and one Windows user at a time.

Personal MacLan Connect employs file-extension mapping to let Macintosh users view common application files with Mac-style icons and open them by double-clicking.

A MacLan Connect Windows machine can make PostScript printers attached to it available to networked Mac users. The Windows machine functions as a print server when it receives Mac print jobs.

For networks that require a server, Miramar offers the \$695 MacLan Connect Gold, which turns an IBM PC or compatible running Windows



Miramar's Personal MacLan Connect lets Windows users function as peers in Mac networks, whether AppleTalk, Ethernet or token-ring environments.

into an AFP (AppleTalk Filing Protocol) server. Miramar said the Personal version is targeted at small workgroups that may be part of a larger Novell NetWare LAN or other network system but also want to provide peer-to-peer services.

"It's an easy way for us to publish our PCs as nodes on the [AppleTalk] network," said Steve Goeckler, senior programmer at The HyperMedia Group Inc. of Emeryville, Calif. "With [Farallon's] PhoneNET PC we had one-way communications; now we've got it two ways."

In addition to NetWare LANs, the software runs over networks based on Microsoft Corp.'s LAN Manager and Windows for Workgroups, Banyan Systems Inc.'s Vines, and IBM Corp.'s OS/2 LAN Server. It supports a variety of AppleTalk, Ethernet and token-ring adapter cards.

Miramar Systems Inc. is at 121 Gray Ave., Suite 200B, Santa Barbara, Calif. 93101. Phone (805) 966-2432; fax (805) 964-1824. □

Saros kit brings cross-platform document management to the Mac

By Nathalie Welch

Bellevue, Wash. — Saros Corp. this month opened its Mezzanine document-management system to Mac users.

Mezzanine 3.0, priced at \$325 per workstation, lets Macs gain entry to a corporate repository via the Saros Software Development Kit for Macintosh. Saros said Mezzanine is the only product available that lets Macs access a cross-platform document-management system.

Mezzanine offers version control and security for documents stored on one or more servers.

Aimed at system integrators and value-added resellers, the Mac kit includes the Mezzanine application programming interface and its Apple-events suites. Apple's MacTCP is also included to provide transport over TCP/IP networks.

With the kit, developers can create application drivers that enable selected Mac applications to transparently access Mezzanine. Developers must choose Mac programs that have a macro language and the capability to trigger external events, such as HyperCard and Microsoft Excel.

Files sent from the Mac and

stored on the Mezzanine server are encapsulated using the MacBinary standard, so both Finder and icon information are preserved.

"First we built an Apple-events interface to Mezzanine so we could easily modify applications our clients are familiar with to access Mezzanine," said Dan Bleeker, vice president of technology for system integrator Mosaic Technology Inc. of Redmond, Wash.

The upgrade also provides easier search procedures. Users can retrieve information based on business-oriented classifiers rather than the traditional file system, which requires the precise location and name of each document to be retrieved.

Mezzanine library services can now reside on NCR Corp.'s Unix platforms and Data General Corp.'s Avion application servers, in addition to Banyan Systems Inc.'s Vines, Novell Inc.'s NetWare, Microsoft Corp.'s LAN Manager, IBM Corp.'s OS/2 LAN Server and Microsoft's OS/2 SQL Servers.

Saros Corp. is at 700 Plaza Center, 10900 N.E. Eighth St., Bellevue, Wash. 98004. Phone (206) 646-1066; fax (206) 462-0879. □

Teknosys delivers Help! Network for remote software support

By Leonard Heymann

Tampa, Fla. — Mac managers will be able to dispense Help! without leaving their desks after Teknosys Inc. ships a network version of its diagnostic software this week.

Help! Network functions much like its stand-alone sibling, analyzing networked Macs to detect software conflicts and offering solutions. The network version eliminates the need for administrators to visit each Mac to get a Help! report.

Software extensions, known as probes, are installed on networked Macs to allow them to report to administrators. Help! Network's administration application then analyzes each configuration using an expert system that contains a database of some 7,600 problems covering more than 3,000 third-party Mac products. The database identifies incorrectly installed files, extension conflicts, insufficient disk space and other problems.

Besides reports on problems and solutions, configuration information can be exported to help administra-

tors keep track of inventory. A future version of the product, due later this year, will create global reports that assemble a software inventory from groups of computers.

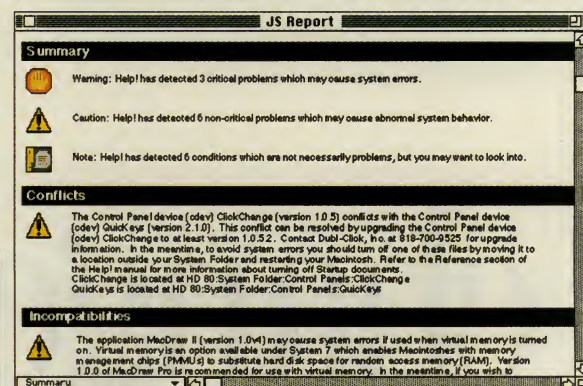
Like the stand-alone version, Help! Network includes a simulation feature that lets administrators test proposed system upgrades.

Future updates of the program will also be able to fix such problems as changing the order extensions load at start-up, the company said.

Help! Network costs \$520 for a 25-user pack, \$989 for 50 users and \$1,656 for 100 users. Teknosys offers two subscription plans to update the program's knowledge base. A \$149 quarterly subscription includes four updates per year, plus any program upgrades. A monthly subscription is \$249.

The company is offering the updates via a dial-in electronic bulletin board, as well as via mail.

Teknosys Inc. is at 3923 Coconut Palm Drive, Suite 111, Tampa, Fla. 33619. Phone (813) 620-3494; fax (813) 620-4039. □



Help! Network from Teknosys uses an expert system to detect problems on users' machines and offers instructions on how to fix them.

Asanté adds line of low-cost Ethernet adapters

By April Streeter

San Jose, Calif. — Asanté Technologies Inc. last week unveiled a new line of Ethernet adapters with fewer features and trimmer prices in a move to capture a larger share of the commodity Ethernet market.

The new cards, dubbed Asanté-Lite, will be available next month for \$189, which is \$40 less than the company's MacCon+ adapters. Asanté-Lite boards will differ from the MacCon+ cards in several ways: They will not include SNMP

(Simple Network Management Protocol) agents; will carry only a three-year warranty rather than Asanté's usual five-year policy; and will ship in unadorned, low-cost packaging.

A NuBus Asanté-Lite card will be available for either 10BASE T, thin or thick network connections. Asanté-Lite boards for the Mac LC series' processor direct slots are available only in 10BASE T or thin versions.

According to Ron Volkmar, Asanté vice president of sales and market-

ing, the new line is in response to the commoditization of the Ethernet adapter market rather than specific price cuts by individual competitors.

Volkmar said the cards will probably erode MacCon+ sales somewhat but are aimed at high-volume buyers who have little need for SNMP or retail-style packaging.

SNMP support can be purchased separately from Asanté for \$25.

Asanté Technologies Inc. is at 821 Fox Lane, San Jose, Calif. 95131. Phone (408) 435-8388 or (800) 662-9686; fax (408) 432-7511. □



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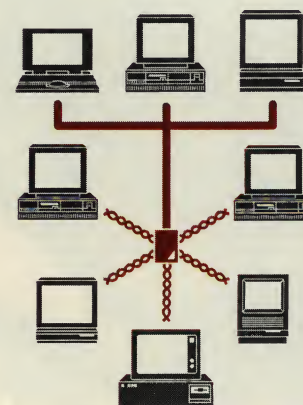
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PB users get HeadsUp personalized news

By Nathalie Welch

Cambridge, Mass. — Beginning next month PowerBook users will be able to receive a personalized daily news summary from Individual Inc.

The HeadsUp news service will be offered to PowerBook users via Motorola Inc.'s Embarc wireless network and its NewsStream wireless data receiver. In addition, Individual this month began offering a fax version of HeadsUp.

In September, HeadsUp will be available via AppleLink, sources said. Individual declined to comment.

For \$49.95 a month, subscribers will receive one- to two-page story synopses a day and will be able to download the full text of one story a month. Additional retrievals are \$4.95 each.

Motorola's wireless paging kit for the Mac is \$435, while the monthly fee to access Embarc is \$15.

HeadsUp uses Individual's text filtering and refining technology to create personal newspapers from more than 200 news sources based on subject areas a subscriber chooses from a list of more than 700 topics.

Users can choose to have HeadsUp summaries dropped into their Lotus Notes application or delivered to a standard Class 2, Group 3 fax machine or computer-based fax package.

The company also offers First!, its full text-only electronic newspaper, which carries an average annual subscription rate of \$8,000 and is intended to be shared among Lotus Notes workgroups of as many as 10 users. First! can also be delivered via electronic mail or fax.

Individual Inc. is at 84 Sherman St., Cambridge, Mass. 02140. Phone (617) 354-2230; fax (617) 864-4066. □

Vomax attends to voice, fax mail

By Nathalie Welch

San Jose, Calif. — Macronix Inc. is shipping a device that acts as a personal communications attendant to manage fax and voice mail independent of computers and telephones.

The \$499 Vomax 2000 lets Mac users send and receive faxes without tying up their computers. Faxes can be received when a Mac is shut down and stored digitally for later retrieval.

Using Macronix's Vomax/M software and the serial cable bundled with Vomax 2000, received faxes can be uploaded to the Mac for display, and outbound faxes can be downloaded into the device for later transmission. Users can fax to distribution lists, forward copies of received faxes to others and maintain faxing logs.

File transfers are possible by attaching the Vomax 2000, with its built-in 9,600-bps fax and 2,400-bps data modem, to the Mac and using Software Ventures Inc.'s MicroPhone LT data communications software, which is included.

In its base 1-Mbyte memory configuration, Vomax 2000 can accept as much as 20 minutes of voice messages or as many as 30 pages of faxes. It can be programmed remotely via touch-tone telephone and can be configured to forward



Macronix's Vomax 2000 for the Macintosh provides unattended fax functions, independent of the Mac, in addition to voice-mail management.

faxes to any Group 3 fax machine or computer-based fax software. It can also forward voice-mail messages to a touch-tone phone.

In August, Macronix expects to offer a 4-Mbyte memory and V.32bis modem upgrade, as well as the TV Fax interface, which will let users display faxes on a TV set and play back any voice annotations included with the fax.

Macronix Inc. is at 1348 Ridder Park Drive, San Jose, Calif. 95131. Phone (408) 453-8088; fax (408) 453-8488. □

Helios USA gains distribution rights for netOctopus

By Leonard Heymann

Cupertino, Calif. — Helios USA, developer of the EtherShare Unix-based Macintosh file server, has acquired U.S. distribution rights for the netOctopus resource-management system from its German developer.

netOctopus from Pole Position had been sold in the United States by MacVONK•USA, which closed its doors last fall. Helios USA will now distribute the product in the United States and Mexico. MacVONK•Canada will continue selling netOctopus in that country and offer U.S. support for other MacVONK products, such as the Ragtime integrated software package.

netOctopus offers a range of Mac network-management functions from a central administration workstation, including file downloading, cross-checking, CPU querying and System 7 tuning. It competes with a number of similar products, including GraceLAN from Technology Works Inc. and StatusMac from ON Technology Inc.

Pole Position later this year is planning to add IPX (Internetwork Packet Exchange) protocol support to netOctopus, which would allow it to monitor IBM PCs and compatibles.

netOctopus prices start at \$645 for an administrator and 10 users.

Helios USA is at 10601 S. DeAnza Blvd., Suite 103, Cupertino, Calif. 95014. Phone (408) 864-0690; fax (408) 864-0694. □

New World revives MacIntercomm telecom package

Woodland Hills, Calif. — Users of MacIntercomm can take heart that the telecommunications package, briefly abandoned by its developer, has found a new life with New World Computing Inc.

New World this month announced that it purchased both MacIntercomm and MacIntercomm Lite from Mercury Systems Inc. of Los Angeles, which unexpectedly closed up

shop in mid-February. New World will assume sales and support of the \$129.95 MacIntercomm, in addition to securing OEM bundling agreements for its MacIntercomm Lite package.

New World Computing Inc. is at 20301 Ventura Blvd., Suite 200, Woodland Hills, Calif. 91364. Phone (818) 999-0606; fax (818) 593-3455. □

Mainstream Newscast adds ZiffWire service

Salt Lake City — Mainstream Data Inc. has added a trio of new sources to its satellite news delivery system for the Macintosh.

Mainstream's \$695 Newscast for QuickMail is server software that works with CE Software Inc.'s QuickMail, WordPerfect Office and Microsoft Mail. Sites with an FM band or satellite disk can receive Newscast news from a variety of publications and news wires.

Newscast now supports ZiffWire, a compendium of news culled from Ziff-Davis Publishing Co. publications, including MacWEEK and PC WEEK; NewsNet, which scans 300 publications from 17 vertical markets; and Information Inc.'s summaries of articles from 650 trade journals and newspapers. ZiffWire is priced at \$30 per user per month. NewsNet costs between \$400 and \$1,000 per month depending on number of users, and Information Inc. costs \$255 per month for a single user and \$1,500 per month for unlimited usage.

Mainstream also offers a one-year start-up package for new users. For \$2,950 Mainstream provides and installs the FM or satellite receiver, server software, and a five-year license to a single news service such as the Knight-Ridder/Tribune Business News.

Mainstream Data Inc. is at 420 Chipeta Way, Suite 200, Salt Lake City, Utah 84108. Phone (801) 584-2800; fax (801) 584-2831. □

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SCSI Ethernet adapter	✓	✓
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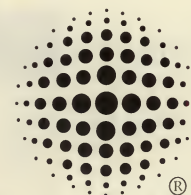
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Dayna

Macintosh Networking Specialists

Quota 3 serves licensed apps to go

By Leonard Heymann

Edmonton, Alberta — Mac users can order licensed software applications “to go” with the latest version of Proteus Technology’s software-licensing server.

Quota 3.0, available now, lets network administrators determine how many users can

simultaneously access an application, according to the number of available licenses. Users can now check out licensed applications to operate in PowerBooks for a predetermined period. Once the license expires, users must reconnect to the server to regain access to the program.

Quota 3.0, which can be run on any networked Macintosh, offers several new messaging features. If a user is denied access to an application because all copies are in use, Quota will notify the user when it becomes available. Administrators can also send messages when users log on or launch a specific program.

“Quota 3.0 is very effective in the way it works,” said Bill Teubert, a systems engineer at Loral Aerospace Development Labs of San Jose, Calif. Loral uses Quota 3.0 to dole out a

limited number of Microsoft Excel copies. “Certainly one of the main advantages is keeping costs of new applications down, as well as upgrades.”

Quota 3.0 ranges in price from \$495 for 20 users to \$3,595 for a 200-user edition. Proteus is offering a 20 percent discount until June 15. Upgrades from Quota 2.0 are available.

Proteus Technology is at 9919 68th St., Edmonton, Alberta T6A 2S6, Canada. Phone (403) 448-1970; fax (403) 425-6882. □

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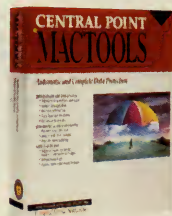
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NoBrainer keeps traffic off network backbone

By April Streeter

Mountain View, Calif. — Tigan Communications Inc. recently shipped a bridge that serves to segment LocalTalk traffic from larger AppleTalk Ethernet networks.

Tigan's NoBrainer is priced at \$1,795. With eight LocalTalk ports and one thin- or thick-net Ethernet port, NoBrainer will keep LocalTalk traffic off a network's backbone and bridge any packets headed for Ethernet destinations.

The NoBrainer can support a single AppleTalk zone with as many as 127 end nodes, connected via Farallon Computing Inc.'s PhoneNET or other connectors to one of the device's eight LocalTalk ports.

According to Tigan, the NoBrainer was designed to compete with Emeryville, Calif.-based Tribe Computer Works' TribeStar, which sells for the same price.

NoBrainer ships with Tigan's Activity Monitoring software, which will give network managers a view of traffic patterns on the LocalTalk segments.

Tigan sells the eight-port MultiRoute for \$3,295. MultiRoute serves as a gateway between AppleTalk and TCP/IP networks. According to Tigan, the MultiRoute will soon be upgraded to include a dial-in port to allow remote access to an AppleTalk network using AppleTalk Remote Access. Pricing has not been set.

Tigan Communications Inc. is at 2218 Old Middlefield Way, Suite K, Mountain View, Calif. 94043. Phone (415) 968-0216 or (800) 833-3397; fax (415) 968-4759. □

Unicom to ship transceivers

Santa Fe Springs, Calif. — Unicom Electric Inc. this month is scheduled ship two \$98 transceivers to connect Ethernet-equipped Macs to an Ethernet network.

The company beats by a dollar Apple's own price for transceivers, which connect the built-in Ethernet cards of Quadras, Centrises and LaserWriter IIg printers to an Ethernet network.

The Mac Trans-10T Transceiver converts signals from the Apple AUI (attachment unit interface) for transmission over 10BASE T Ethernet, while the Mac Trans-2/5 converts Apple AUI for thin-net Ethernet networks.

Both units have an LED light to show activity. The transceivers include 6 feet of cable between the box and the network connector.

Unicom Electric Inc. is at 11980 Telegraph Road, Suite 103, Santa Fe Springs, Calif. 90670. Phone (310) 946-9650 or (800) 346-6668; fax (310) 946-7473. □

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Specular to set logos in motion

3-D animation app to cost less than \$200

By Neil McManus

Amherst, Mass. — Specular International Ltd. hopes to bring the price of 3-D animation down to earth with a new "flying logos" package that will retail for less than \$200.

Due in September, Infini-D LogoMotion will be based on technology from Infini-D 2.5, Specular's \$996 3-D modeling, rendering and animation program. LogoMotion is designed for users creating animated 3-D logos and titles for QuickTime movies and business presentations.

LogoMotion will have a Stage-Hand feature that will let users quickly arrange scenes. The program will come with a variety of preanimated cameras and objects, such as juggling clubs and barking



Specular International's Infini-D Logo-Motion extrudes Type 1 and True-Type fonts into 3-D with beveled edges. It comes with a sequencer for controlling time-based animations.

dogs. Users will be able to import PICT images as backgrounds and set up any number of spot and point lights.

Generic 3-D primitives will include spheres, cones and cylinders. The program will be able to import Encapsulated PostScript and DXF (Drawing Interchange File) files and extrude Type 1 and TrueType fonts into 3-D forms

with beveled edges. It will come with reflective metal and plastic surfaces.

A sequencer will control time-based animation. LogoMotion will render with Gouraud shading instead of Infini-D's higher-quality Phong shading and ray tracing. Users will be able to anti-alias animations and export them as PICT, PICS or QuickTime movie files.

Specular International Ltd. is at 233 N. Pleasant St., P.O. Box 888, Amherst, Mass. 01004-0888. Phone (413) 549-7600; fax (413) 549-1531. □

Nikon exposes handheld color camera

By Matthew Rothenberg

Melville, N.Y. — Nikon Inc. is preparing to enter the electronic color picture with a new handheld digital camera it will unveil at next month's Nexpo show in New Orleans.

The D1, which Nikon said it

plans to ship next year, is based on proprietary technology. It uses a CCD (charge-coupled device) sensor that captures 1.7 RGB (red, green, blue) images per second at a maximum resolution of 1,088 by 840 pixels. The D1, which weighs 3.5 pounds, has the look and feel of a single-lens-reflex camera and accommodates most F-mount Nikkor lenses, Nikon said.

The device stores 4 Mbytes of JPEG (Joint Photographic Experts Group)-compressed image data on a PCMCIA card manufactured by the Japan Electronic Industry Development Association. It runs on a rechargeable nickel-cadmium battery and includes a SCSI interface for direct connection to the Mac.

The camera includes an electronic shutter with speeds ranging from 0.0005 to 1 second, as well as manual and automatic focus and white-balance controls.

Although the company has not set pricing for the D1, it said the camera will be competitive with systems that cost from \$8,000 to more than \$20,000.

Nikon Inc. is at 1300 Walt Whitman Road, Melville, N.Y. 11747-3064. Phone (516) 547-4200; fax (516) 547-0305. □

Timeworks to do all-in-one DTP

By Carolyn Said

Northbrook, Ill. — Timeworks Inc. is working on a new cross-platform publishing program that will combine word processing, drawing, database and page-layout capabilities, the company said.

Timeworks will show the as-yet-unnamed 32-bit program privately at Comdex/Spring '93 this month. The company said it expects to ship the software in the second quarter of next year for about \$700.

Timeworks said it has developed a core engine that contains about 80 percent of the program's code, making it simpler to port the application

See Timeworks, Page 30

Autologic, Optronics imagesetters bring 4,000 dpi to film, plates

By Matthew Rothenberg

San Francisco — Autologic Inc. and Optronics have both released new 4,000-dpi imagesetters.

► Autologic has introduced the APS-7 Imposetter line of imagesetters, which comprises three models that feature image areas ranging from 26 by 36 inches to 47 by 63 inches. All three devices print to red-sensitive film or polyester-plate material. They cost between \$230,000 and \$400,000, Autologic said, and can output a 2,000-dpi letter-size page in 4 to 13 minutes.

The devices connect directly to Autologic's PostScript or GICL Page Image Processor (PIP) systems, which rasterize files for output on Autologic imagesetters. As many as eight Autologic imagesetters can be connected to a single PIP. Mac users can connect to the PIP via an AppleTalk, EtherTalk or TCP/IP interface.

► Optronics is shipping the ColorSetter XL 4000, which can output images measuring up to 40 by 51 inches at user-selectable reso-

lutions of 2,000 or 4,000 dpi to blue-sensitive film, paper or plate material. The imagesetter can output up to 20 megapixels per second.

The \$219,500 device ships with Optronics' own PostScript interpreter and 35 Type 1 fonts. The ColorSetter XL 4000 can also be outfitted with a Level 2-compatible software RIP (raster image processor) from Harlequin Ltd. that supports composite fonts. It includes Ethernet, EtherTalk, Network File System, RS-232, RS-449 and SCSI interfaces.

The ColorSetter XL 4000 includes an on-board Unix server with a 1.2-Gbyte hard disk and 32 Mbytes of RAM.

The company also delivered the ColorSetter XL 2000, a 2,000-dpi version of the device, for \$199,500.

Autologic Inc. is at 1050 Rancho Conejo Blvd., Thousand Oaks, Calif. 91320. Phone (805) 498-9611; fax (805) 499-1167.

Optronics, a division of Intergraph Corp., is at 7 Stuart Road, Chelmsford, Mass. 08124. Phone (508) 256-4511; fax (508) 256-1872. □

MacroModel 1.5 bends, twists, tapers objects

By Neil McManus

San Francisco — Macromedia Inc. this week will ship an upgrade to MacroModel that lets users manipulate entire 3-D objects without having to edit individual control points.

MacroModel 1.5 for Macintosh, still priced at \$1,495, is file-compatible with a new Windows version of the 3-D modeler.

The upgrade includes "deformation" tools that bend, twist and taper entire objects; a cross-section tool that lets users model in a manner similar to that of the company's Swivel 3D; and a bevel-extrude tool that lets users set measurements for round or flat bevels before they extrude an object.

Construction objects can be resized in Version 1.5, allowing users to adjust grids and signposts in 3-D space. Users can also adjust resolution on a per-object basis and nudge objects using the arrow keys.

In addition, the new version can import Encapsulated PostScript files and export RIB (RenderMan Interface Bytestream) shadows.

Peter Moser, an artist at Cogent, a design company in San Marcos, Texas, said he used a beta copy of MacroModel 1.5 to create an animation of seaweed floating underwater. "We used the deformation tools to extend blocks and bent and twisted them to look like they were moving fluidly with the current," he said.

Moser said the program's cross-platform capability lets artists on both Macintoshes and 486-based Windows machines work on dif-

ferent parts of the same model.

Macromedia is offering the Mac version bundled with Pixar's MacRenderMan for \$1,795 and packaged with Macromedia Three-D for \$2,495. The Windows version ships with RenderMan for \$1,795.

Upgrades to Version 1.5 are \$99 before July 31 and \$149 thereafter.

Macromedia Inc. is at 600 Townsend St., San Francisco, Calif. 94103. Phone (415) 442-0200; fax (415) 442-0190. □

Artist Donald Grahame used MacroModel 1.5's deformation tools to quickly create many of the elements on this car. He rendered the image with Pixar's MacRenderMan.



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OSC to ship MIDI sequencer, upgrade Deck software

By Kirsten L. Parkinson

San Francisco — OSC next month will roll out a new MIDI sequencing program as well as an upgrade to Deck, its digital audio workstation software.

► **Metro**, a \$225 sequencing program, offers users real-time editing and mixing of

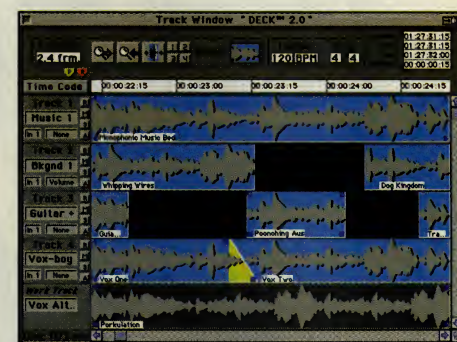
MIDI (Musical Instrument Digital Interface) tracks in graphic piano-roll and mixing views.

Users can edit tracks linearly or divide them into sections to create an almost unlimited number of separate tracks.

With built-in support for Opcode Systems

Inc.'s Open Music System, the program handles more than 500 MIDI channels. Metro also includes an option that lets users play and record music without a metronome and then drag measure bars to an exact beat to add new parts and print.

Other features include support for MIDI



Version 2.0 of Deck from OSC adds a visual waveform window that allows users to cut, paste and edit multiple digital audio tracks.

Manager and MIDI Timepiece and import and export of standard MIDI files.

Previously called Beyond, Metro will initially be released as Version 2.4.

► **Deck 2.0** adds editing capabilities to the program's mixing features. A built-in visual waveform window allows nondestructive recording and track flipping, so users can create and edit dialogue and song arrangements.

Version 2.0 incorporates QuickTime support, allowing users to synchronize digital audio to QuickTime movies. Users can then save the edited tracks as either eight- or 16-bit files.

OSC said other new features in Deck 2.0 include real-time automation of volume and pan as well as full support of all SMPTE timecode formats and continuous resynchronization.

Deck 2.0 lists for \$299; upgrades are \$99.

OSC is at 480 Potrero Ave., San Francisco, Calif. 94110. Phone (415) 252-0460 or (800) 343-3325; fax (415) 252-0560. □

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4490A Imagesetter	\$22,995
4990S Imagesetter	26,995



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Timeworks

From Page 28

to different platforms. The initial release will include versions for Macs, Windows NT and possibly OS/2. Versions for Unix and PowerPC are also strong possibilities, according to the company.

Timeworks said the program will offer identical functionality across platforms, permitting seamless document sharing. The company said it has not yet decided how to handle the problem of font portability, however.

Features will include page styles, which work like master pages; object, paragraph and character styles; and a user-definable number of undo levels.

According to the company, the interface will rely heavily on point-and-click controls instead of dialog boxes. Floating panels will let users modify all parts of a publication interactively. Users will also be able to drag and drop colors and styles.

The program will offer sophisticated illustration and typographic tools, Timeworks said, and will be extensible via third-party add-ons.

In addition, Timeworks last month shipped Color It! PrePress, a \$149 four-color correction and separation utility for users of its Color It! \$299 image-editing and painting program (see MacWEEK, Feb. 15). Color-It! users can buy the PrePress program for \$49.95.

Timeworks Inc. is at 625 Academy Drive, Northbrook, Ill. 60062. Phone (708) 559-1300 or (800) 323-7744; fax (708) 559-1399. □



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MEDIA VISION

Vendors compose new sound collections

Volumes include sound effects, music

By Kirsten L. Parkinson

San Francisco — Users looking to tune up their multimedia presentations can choose from a plethora of new music and sound-effect collections.

► **The Music Bank** is shipping Blockbuster Sound F/X, a \$69.99 collection of 142 sound effects, including airplanes, applause, laughter, crickets and an Islamic prayer call.

Each clip comes in several formats, including CD-Audio, snd files, and mono and stereo AIFF (Audio Interchange File Format) at both eight and 16 bits.

► **Ransom Electronic Media** is offering a disc of 100 music tracks in AIFF, CD-Audio and General MIDI (Musical Instrument Digital Interface) formats.

The \$99 Loops incorporates music clips in a number of styles, including rock, jazz and fusion.

► **Arizona Macintosh Users Group** has unveiled the \$99 Music

Madness: Volume II, which provides 158 rock, jazz, funk, Latin and drum clips in HyperCard, System 7 and 16-bit stereo AIFF formats.

All of the clips are available royalty-free as long as users credit the artist.

► **Ebook Inc.** this month will roll out two sound compilations costing \$24.95 each.

A Zillion Sounds!, developed with BeachWare of San Diego, offers 2,177 sound effects. Clips include animal sounds, bells and scary noises in SoundEdit, System 7 and PC WAV file formats.

Volume I of the Airworks Music Library, developed with Airworks Media Services Ltd. of Edmonton, Alberta, has more than 1,000 classical, country-western, rock 'n' roll, and soul music selections. Each clip comes in several lengths in AIFF and CD-Audio formats.

► **Alex Studer Music & Design** has three volumes of original music for \$29 each. Each volume of ClipMusic Snippets contains about 15 clips that are 20 to 30 seconds in length.

The music clips, which are in QuickTime movie format, represent a variety of styles, including hard rock, jazz and new age. Full-length versions of each piece are available separately for \$20 to \$40.

The Music Bank is at P.O. Box 3150, Saratoga, Calif. 95070. Phone (408) 867-4756; fax (408) 867-0518.

Loops is available from Educorp, 7434 Trade St., San Diego, Calif. 92121-2410. Phone (619) 536-9999 or (800) 843-9497; fax (619) 536-2345.

The Arizona Macintosh Users Group is at 4131 N. 24th St., Suite A-120, Phoenix, Ariz. 85016. Phone (602) 553-8966; fax (602) 553-8771.

Ebook's products are available from Electronic Arts Inc., 1450 Fashion Island Blvd., San Mateo, Calif. 94404. Phone (415) 571-7171 or (800) 245-4525; fax (415) 570-5137.

Alex Studer Music & Design is at 1428 Masonic Ave., San Francisco, Calif. 94117. Phone (415) 863-4203; fax (415) 863-6331. □

Interactive Media packages player, Photoshop support in Special Delivery 1.1

By Neil McManus

Los Altos, Calif. — Interactive Media Corp. recently posted Special Delivery 1.1, which includes a new runtime player and supports Adobe Photoshop files.

Still priced at \$399, the presentation program now comes with QuickTime 1.6, making it compatible with Eastman Kodak Co.'s Photo CD files.

Special Delivery also supports

PICT, TIFF, Encapsulated PostScript and MacPaint images as well as QuickTime movies. Users can outfit electronic slides with buttons that start, stop, rewind and forward a movie; play sounds; or navigate through a presentation.

Users can distribute up to 20 copies of the new Special Delivery runtime player with their presentations. IMC is also offering a player optimized for CD-ROM development.

In addition, IMC recently introduced The Media Cataloger 1.1. The upgrade to the \$99 image-cataloging program supports Photoshop as well as Photo CD files.

Upgrades to Special Delivery and Media Cataloger are free to registered users.

Interactive Media Corp. is at P.O. Box 0089, Los Altos, Calif. 94023. Phone (415) 948-0745. □



IMC's Special Delivery 1.1, which costs \$399, comes with a runtime player, allowing users to distribute presentations to users who don't have the program.

Ethernet Speeds—LocalTalk Prices

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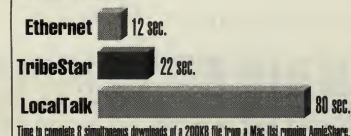
and hubs, TribeStar is "very cost-effective," as MacUser put it. ★ Over time, you may want to connect more of your users directly to

Ethernet. TribeStar offers the perfect path. When users require increased speed, simply switch them to the Ethernet side.

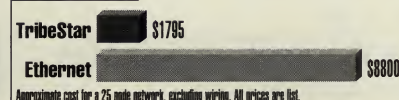
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* MacUser, June 1993, pg.140

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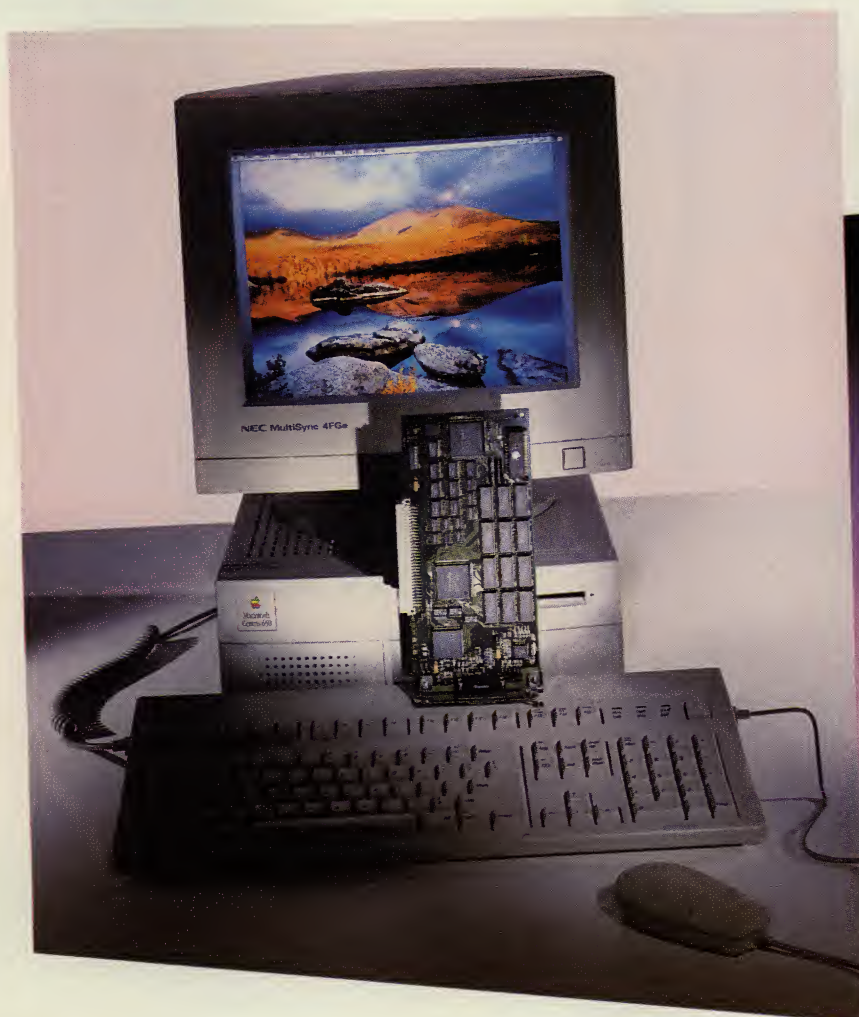
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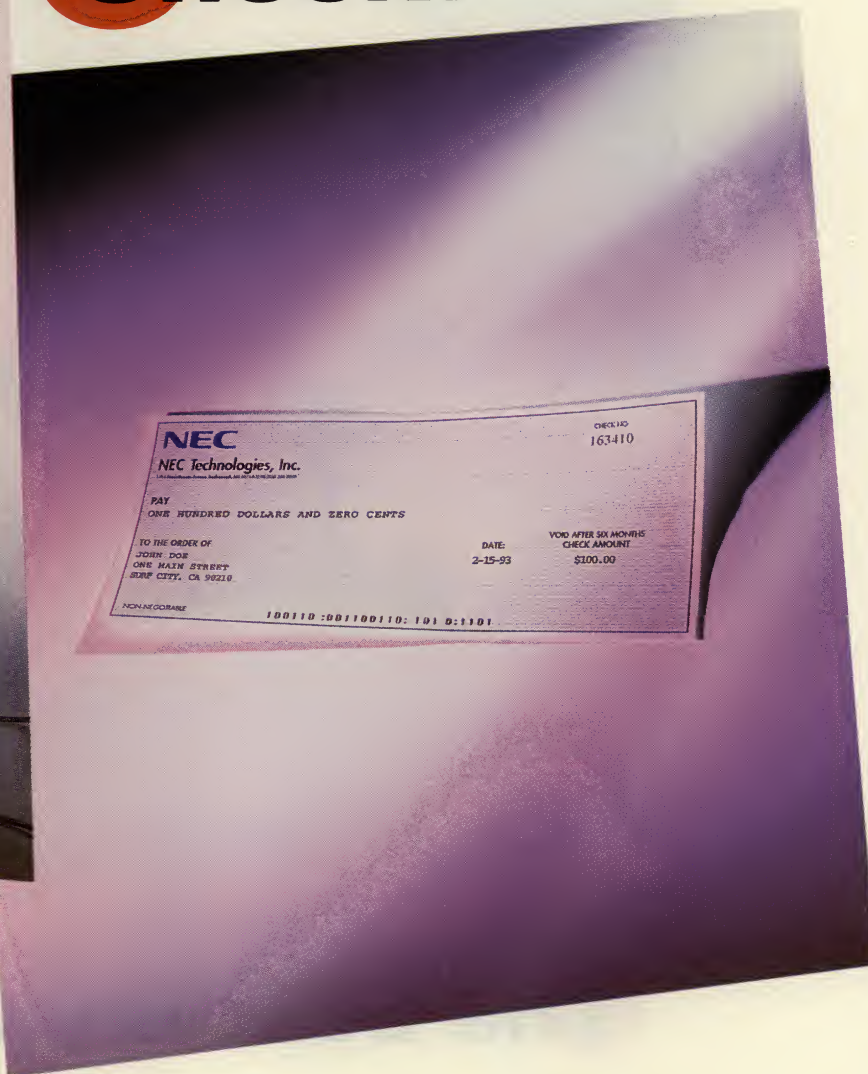
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Aldus draws up deal to buy PIM vendor After Hours

Acquisition will bolster Aldus consumer line

By Lisa Picarille

San Diego — In a move to broaden its Consumer Division, Aldus Corp. last week signed a letter of intent to acquire After Hours Software.

Both companies declined to provide details but said the deal should be completed next month.

According to industry sources, After Hours, a private Van Nuys, Calif.-based company with 33 employees, is expected to post sales of \$5 million to \$6 million in fiscal year 1993, ending July 31.

After Hours' line of popular, inexpensive personal information managers for the Mac include Touchbase Pro, a contact-management program, and Datebook Pro, a calendar and to-do list manager. Windows versions of both products are slated to ship before the end of the year, according to After Hours President David Gang.

Aldus' Consumer Division, based here, was formed in 1992. The unit previously comprised products acquired in Aldus' 1990 buyout of Silicon Beach Software. In that \$25 million stock swap, Aldus got a host

of popular Mac-based programs, including SuperPaint and Digital Darkroom. Aldus has since added its Gallery Effects and IntelliDraw packages to the division.

Other developers are also looking to boost their consumer offerings. Earlier this month, Symantec Corp. spent \$41 million to acquire Contact Software International, developer of ACT!, a popular contact manager (see MacWEEK, May 10). Symantec was also reportedly interested in buying After Hours.

"We were not shopping ourselves around," Gang said. "But we were concerned about our future. We thought that if we were going to have to compete with the big boys, we would need additional marketing and development." □

WordStar, SoftKey merge; stock swap totals \$213 million

By Lisa Picarille

Novato, Calif. — WordStar International Inc. this month merged with SoftKey Software Products Inc., a Toronto-based developer of low-cost productivity and tax-preparation software for DOS and Windows, in a stock swap worth \$213 million.

The deal creates a company worth more than \$90 million. WordStar, which offers an array of writing tools for the Mac and IBM PCs and compatibles, had fiscal-year 1993 revenues of \$34.5 million. The company earlier this year acquired WriteNow, the Mac word processor formerly marketed by T/Maker Co.

See WordStar, Page 39

Apple mail-order catalog helping sales, dealers claim

By Jon Swartz

San Francisco — When Apple delivered its first product catalog to customers last fall, conventional wisdom was that Apple dealers would take a hit.

Not so, according to dealers, who claim the mail-order catalog has helped rather than hurt Macintosh sales.

"As long as Apple maintains nondiscounted prices of its products on the list, it will make users more aware of what's available out there," said Jack Snell, president of Microcomputer Center of Baltimore. "What little effect the catalog has had on us has been positive."

Even Apple's plans to add small-business sites to the 1.1 million customers on its mailing list won't put a crimp in sales, according to dealers.

The Apple catalog, which has met Apple's revenue expectations, offers the PowerBook 145; StyleWriter printers; and discounted third-party software from Claris Corp., Aldus Corp. and others (see MacWEEK, Nov. 23, 1992).

Most dealers said they are more concerned about Mac LC III shortages and their inability to sell Performas than an extended mailing list for Apple's product catalog.

Ron Dagenais, president of MicroAge Computer Systems & Software of Leominster, Mass., said even though 90 percent of his store's sales come from small business, he's more anxious to get his hands on the "hot-selling LC III."

"It remains to be seen if [the catalog] will hurt us," Dagenais said. "Then again, [Apple] has done nothing but weaken its dealer base the past year." □

Apple, Rio company drop dispute

By Jon Swartz

Rio de Janeiro, Brazil — Apple and a Brazilian computer maker have resolved a 10-year trademark dispute that seriously hampered Mac sales in one of Latin America's hottest markets.

The long-simmering feud — over Rio de Janeiro-based Dismac's

use of the Apple name on its IBM PC compatibles — has prevented Apple from directly shipping its products in Brazil, although some of its machines have been sold through independent companies.

Trade experts said it is not uncommon for the Brazilian government to block the sale of imported products on the basis of claims from local companies that the products violate trademarks. "The Brazilian government has always followed a policy, particularly with a large American company, of trying to cut a deal to have a dispute dropped," said Myles Frechette, assistant U.S. trade representative for Latin America.

But an Apple Pacific spokeswoman said Dismac simply dropped its claim and did not sign a financial or technology agreement.

Dismac officials could not be reached for comment. However, published reports in Brazil said the company paid Apple an undisclosed amount of cash as part of a settlement.

Industry observers said the settlement will improve Apple's standing in the fledgling personal computer market in Brazil, which is expected to grow 14 percent to \$453 million this year, according to International Data Corp. of Framingham, Mass. □

MacWEEK index ELECTRONIC-MAIL SALES

The installed base of LAN electronic-mail software worldwide from 1992 to mid-1993.

PRODUCT	1992	MAY 1993
Lotus cc:Mail, Notes	2,200,000	3,200,000
Microsoft Mail	1,600,000	2,200,000
DaVinci eMAIL	1,100,000	1,300,000
WordPerfect Office	1,000,000	1,100,000
CE Software QuickMail, InBox	750,000	900,000
Banyan Network Mail	675,000	750,000
NoteWork's NoteWork	300,000	300,000
Futurus' Team	250,000	250,000
Higgins Group's Higgins	250,000	200,000
Beyond's BeyondMail	125,000	150,000
Other	250,000	400,000
Total	8,500,000	10,750,000

Source: Safeware, The Insurance Agency Inc.

StockWatch

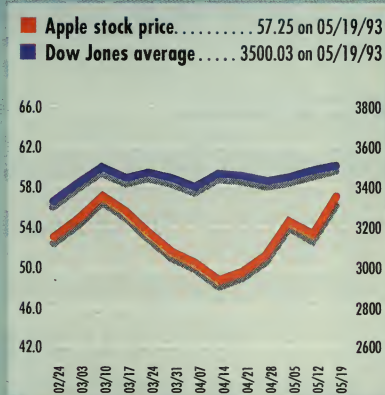
	05.19.93 CLOSE	WEEKLY % CHANGE
Apple	57.25	7.51
SOFTWARE DEVELOPERS		
Adobe	68.50	15.61
Aldus	17.00	11.48
Caere	8.00	-13.51
CE Software	3.75	-7.70
Microsoft	92.50	7.25
Novell	31.50	5.88
Symantec	17.50	3.70
PERIPHERALS VENDORS		
CMS	2.63	16.67
HP	87.75	12.32
Mass Micro	0.38	0.00
QMS	15.75	6.78
Radius	3.75	-3.23
RasterOps	6.63	-4.51
Sigma	5.75	0.00
SuperMac	17.38	-8.55
STORAGE		
Conner	13.13	0.96
Maxtor	8.13	14.04
Quantum	13.75	-0.90
Seagate	17.00	7.94
SyQuest	13.00	0.00
INDUSTRY INDICATORS		
DEC	47.75	3.24
IBM	49.63	3.39
Motorola	80.13	5.43
Sun	28.63	13.93
Dow Jones	3500.03	0.51

Compiled by Nordby International Inc.

Aldus Corp.'s announcement that it has signed a letter of intent to acquire After Hours Software struck a positive chord with investors last week. The Seattle-based software company's stock increased 11.5 percent to close at \$17

per share (see story, this page).

The proposed acquisition would add Touchbase Pro and Datebook Pro, two popular personal information manager programs, to Aldus' consumer offerings.



Acquisition boosts Aldus stock



Why buy any other display when you can now get a 15" PrecisionColor™ Pivot® for just \$1149. It's like getting two great displays for the price of an ordinary one.

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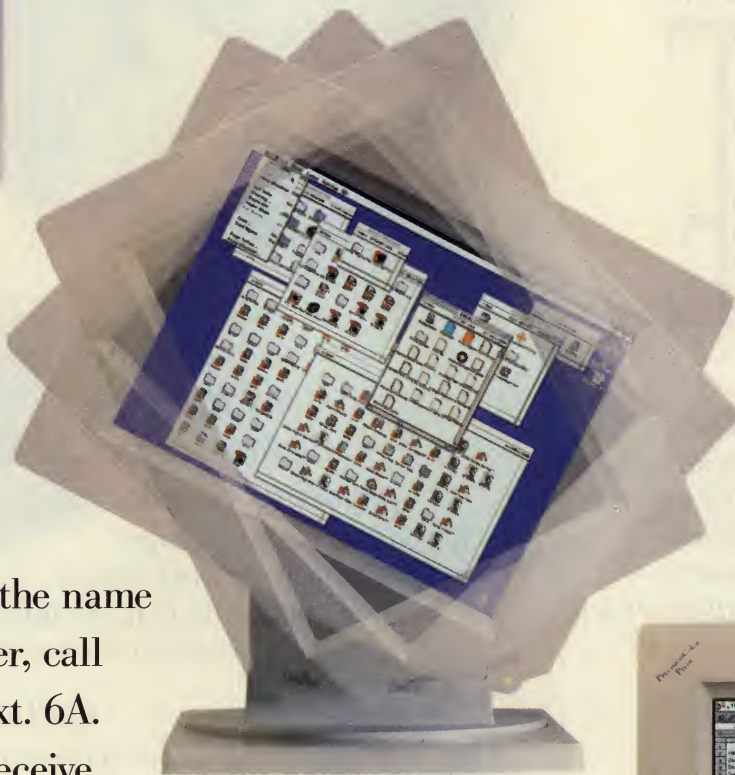
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Make sure you see traps and overprints before you make films. The 3M Rainbow™ desktop color proofing system is the only continuous-tone PostScript™ desktop system that shows them.



Don't cramp your style.

Most desktop proofing systems won't allow you to print a true spread image without tiling. The Rainbow proofing system, on the other hand, has an 11.9" x 17.2" image area.

STYLE

Be flexible.

The Rainbow system software lets you simulate the color and density of different printing processes — commercial sheet-fed, publication or newspaper printing.



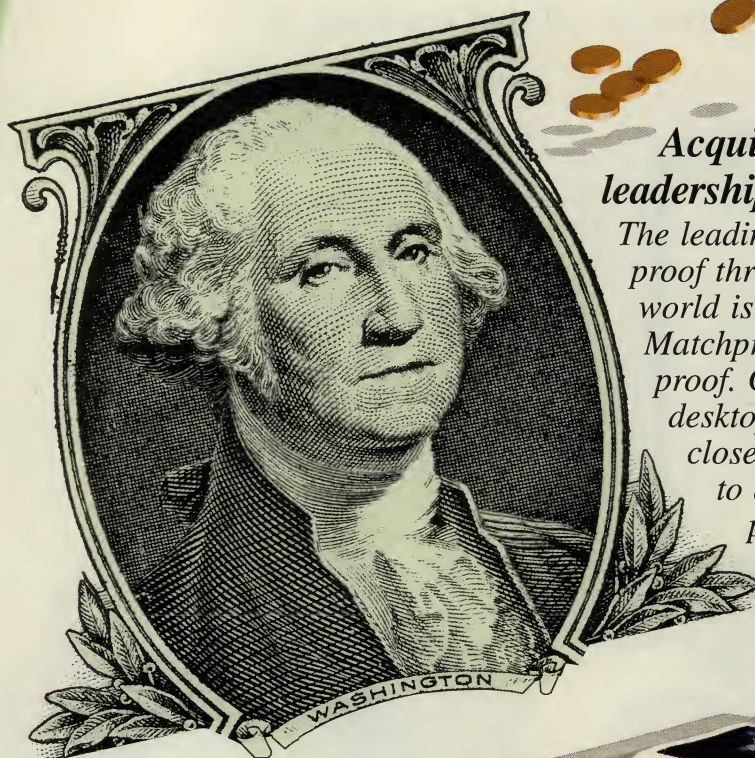
Use all the colors in the rainbow.

Most desktop color printers use only three inks. But the Rainbow proofer uses yellow, magenta, cyan and black dyes to give you a more accurate proof.



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If you want a better way to evaluate your work before making films, this is it. As this guide shows, the Rainbow proofing system is far superior to other color printers.



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For more information about the Rainbow desktop color proofing system or to have a 3M sales representative contact you, call 800-328-1684, ext. 350. 3M Image Reprographic Systems Division, 3M Printing and Publishing Systems Division, 3M Center Bldg. 223-2N-01, St. Paul, MN 55144-1000.



3M Imaging

Kiosk vendor touched by 7 lawsuits

By Ian G. Jacobs

San Francisco — Intouch Group Inc., manufacturer of a Mac-based multimedia kiosk designed to boost record sales, has been deluged with lawsuits from former employees, but company attorneys called the suits a "groundless assault" filed to "harass" Intouch.

One of the seven lawsuits, alleging the i.Station technology was pilfered, seeks \$222.5 million from the company and its investors, including RasterOps Corp. CEO Kieth Sorenson and Esprit de Corp founder Susie Tompkins.

"[Intouch President Josh Kaplan] likes to say that he came up with the idea for the i.Station while walking in Switzerland. What he forgets to mention is that he was walking with me," said Dent-de-Lion du Midi, who filed the suit. "The truth will come out like when you bury a body in the backyard, and two years later the hand pops out of the ground."

Two suits filed by other former employees have already been dismissed with prejudice by a federal court here. One claimed that employees were improperly classified as contract workers, thus depriving them of the right to collect unemployment insurance.

MECA sales move up 55% in 3rd quarter

Fairfield, Conn. — MECA Software Inc., a developer of personal productivity software for the Macintosh, had a productive quarter of its own, last week posting a 55 percent rise in sales.

The company, based here, said sales for its third quarter ended March 31 were \$13.1 million, compared with \$8.5 million in the same quarter a year ago. Profits, meanwhile, were \$2.98 million, compared with a loss of \$4.95 million a year ago.

Moreover, MECA's sales for the past nine months were \$27.9 million, up 80 percent from \$15.5 million during the same period last year. Profits were \$2.2 million vs. a \$5.6 million loss.

MECA officials attributed the dramatic financial turnaround to the company's recent sale of Great American Software's products for \$5.8 million. MECA took a one-time charge of \$4.8 million when it acquired the company last year. □

HP sales top \$5 billion

Palo Alto, Calif. — Hewlett-Packard Co., buoyed by a 28 percent increase in worldwide orders, last week broke the \$5 billion mark in quarterly sales for the first time in its 54-year history.

The company, based here, reported sales of \$5.1 billion for its second quarter ended April 30, up 21 percent from \$4.2 billion in the same quarter a year ago. Profits were slightly up, to \$347 million from \$323 million last year.

Fueled by strong demand for DeskJet and LaserJet printers, HP's second-quarter orders were a record \$5.4 billion, compared with \$4.2 billion last year. International orders topped \$3 billion, according to an HP spokesman. □

Richard Johns, an attorney who represents Intouch, said one of the plaintiffs' lawyers has been declared a "chronic litigant" and ordered by the courts not to file frivolous lawsuits.

The i.Station has been test-marketed at dozens of music stores nationwide, including Tower Records. □

WordStar

From Page 36

SoftKey, a privately held company with 240 employees, will move to WordStar's headquarters here. Neither company would comment on how many jobs would be lost as a result of the merger. WordStar employs 140 people.

Ron Posner, WordStar chairman and CEO since October 1990, will relinquish his day-to-day responsibilities to become an active board member and focus on acquisitions and

investor relations. "This move is by my choice, and it's where I think I will be most effective at this stage of my life," Posner said. "These activities are the ones I enjoy the most, and I think they're my strength."

Industry observers said the merger gives WordStar access to SoftKey's strong U.S. retail and distribution channel. The company markets more than 100 products, including several Mac font packages. Last month it released KeyCAD, a \$39.95 CAD package for the Mac. □

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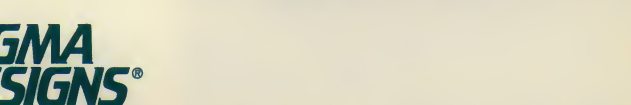
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THE EYES AND EARS OF MULTIMEDIA™

Campaign hinges on sale of Mac firm

By Lisa Picarille

Campbell, Calif. — Some say politicians sell their souls to get elected. Peter James instead must sell his software company to finance his bid for a California congressional seat.

James, general manager of Sunrise Tech-

nology here, has put the private 5-year-old Mac network software company on the block to bankroll his run for California's 17th Congressional District seat, which covers Santa Cruz and Monterey counties.

The seat became vacant this year when Leon Panetta was tapped by President Clin-

ton as director of the Office of Management and Budget.

As an independent candidate, James is not eligible for government funds and must finance his own campaign. He estimates 70,000 to 100,000 voters will participate in a three-way runoff election June 8 and that he needs to raise \$200,000 to \$400,000 to be a serious contender.

"Selling off the company or part of the company is the only real shot I have to raise

the money needed to win the election," James said.

Despite discussions with a variety of companies, including Delrina Technology Inc. of Toronto, James has yet to find a buyer. He declined to disclose the asking price for Sunrise or the company's revenues.

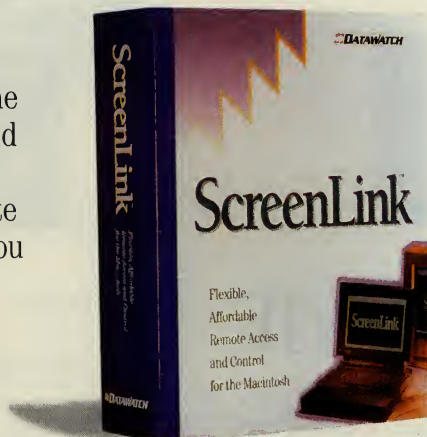
Sunrise develops Zap Fax and Zap Phone, Mac-based software for sharing a single fax modem or voice-mail device over a network, respectively. □

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Focus Enhancements files for public offering

Woburn, Mass. — Focus Enhancements Inc., the mail-order catalog company started last year that offers Macintosh networking and peripherals products, last month announced plans to go public.

The company, based here, said it has filed a registration statement with the Securities and Exchange Commission for an initial public offering of 1.425 million shares of common stock. The IPO is scheduled for next month.

The public offering will be underwritten by Thomas James Associates Inc. of Rochester, N.Y., which expects an initial price per share of \$4.

Focus employs 35 people. The company posted sales of \$3.7 million and a \$1.7 million loss for its fiscal 1992 year. □

GM, GE may pool computer purchasing

San Francisco — General Motors Corp. and General Electric Co. are considering combining their personal computer purchasing in a move to ensure faster delivery of equipment and services at lower prices from Apple and other vendors.

According to published reports, the industrial giants have met several times in recent months to discuss ways to increase their influence over major manufacturers such as Apple, IBM Corp. and Compaq Computer Corp.

A GM-GE alliance would create a consortium that could purchase as many as 100,000 desktop computers annually, according to industry observers. The companies would make their purchases through Electronic Data Systems Corp., GM's computer services subsidiary, sources said. □

Strategic maps acquisition

Santa Clara, Calif. — Strategic Mapping Inc. has agreed to purchase Donnelley Marketing Information Services, a unit of A.C. Nielsen Co. that specializes in demographic data.

SMI, a maker of Mac and IBM PC and compatible mapping software, is no stranger to DMIS. Previously, SMI marketed DMIS data as an add-on to its software, and DMIS offered SMI software as a tool for viewing and analyzing its data.

Although terms of the deal were not disclosed, the combined sales of both companies is about \$40 million, according to SMI. □

the MacWEEK 200

UNIX
Education

FINANCE



MacWEEK's survey of the largest Mac-using sites examines why managers in a multiplatform world continue to invest in Macintosh technology.

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Page 57

MacWEEK's fifth annual survey of top U.S. and Canadian Mac sites

May 24, 1993

Medicine

1993 MacWEEK 200: Top sites want more power, PowerBooks

This fifth annual report on the largest Mac sites focuses on the results of the MacWEEK 200, MacWEEK's survey of the largest U.S. and Canadian commercial and government sites, and its companion survey, the Education 50, a survey of the largest U.S. and Canadian higher-education institutions.

The top Macintosh sites in the United States and Canada lean toward Mac II-family models, they're hooked on PowerBooks, and their desktop futures stress increased processing power.

These and other findings highlight the 1993 MacWEEK 200, MacWEEK's fifth annual survey identifying the 200 U.S. and Canadian commercial and government sites with the largest Macintosh installations. These sites account for a total of 333,531 Macs, or an average of 1,668 per site.

In a related survey, the Education 50,

MacWEEK conducted its third annual survey of the top 50 Macintosh-using education institutions. The survey found sites that collectively account for more than 178,000 Macs, or 3,564 Macs on average per site (see Page 56).

Installed base. All MacWEEK 200 sites have Mac II-series computers, with these models accounting for the majority (59 percent) of all Macs installed. More specifically, one-third (33 percent) of the total Macs installed is either a IIfx or IIsi, while one in four (26 percent) is another model in the Mac II line.

Compact Macs, including the Classic, Classic II, SE/30 and SE, are also common at the sites surveyed. Together they account for 20 percent of installed Macs.

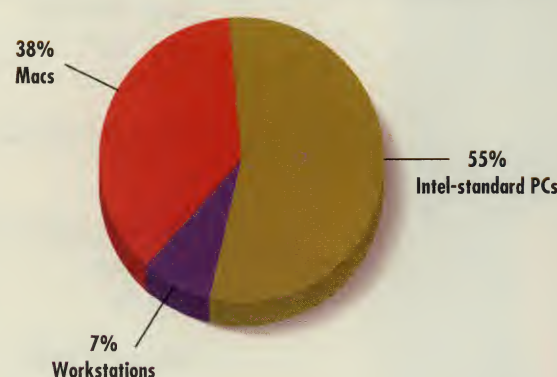
While 92 percent of the top 200 sites have Quadras or Centris models at their work sites, these high-end Macs represent only 5 percent of all installed Macs.

PowerBooks are equally pervasive, with almost all (91 percent) of the top 200 Mac sites reporting them in use. Sixty-one percent of the sites have Duos. PowerBooks, including Duos, account for only 6 percent of installed Macs. Other Macintoshes, including the LC, account for the remaining 10 percent.

Other computers. Virtually all the top Mac locations have Intel-standard personal computers installed, with an average of 2,426 at each of the 200 sites. In addition, these sites report an average of 319 workstations per location.

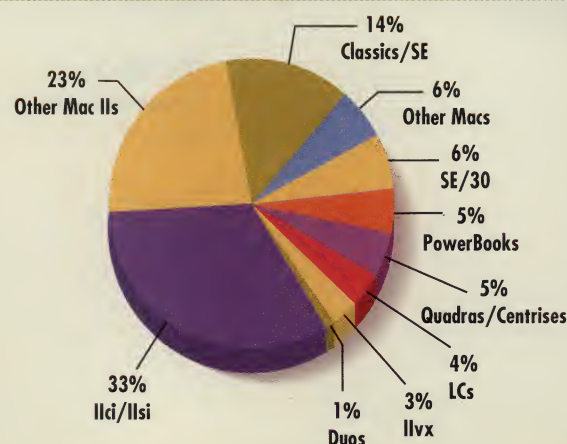
Taken as a whole, the MacWEEK 200 companies have almost 1 million microcomputers or workstations installed, for an

Microcomputer and workstation breakdown



Base: Total number of personal computers and workstations installed.

Breakdown of Mac models installed



Base: Total number of Macintoshes installed.

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
1	Eastman Kodak Co.*	Rochester, N.Y.	17,630	36,000	4,200
2	Lawrence Livermore National Laboratory	Livermore, Calif.	10,000	1,900	2,000
3	Westinghouse Savannah River	Aikens, S.C.	8,345	N/A	N/A
4	Jet Propulsion Laboratory	Pasadena, Calif.	6,875	8,000	3,500
5	Pacific Bell Co.	San Ramon, Calif.	6,750	4,800	400
6	Northern Telecom Inc.*	Research Triangle Park, N.C.	6,430	2,300	530
7	Naval Air Warfare Center Weapons Division	China Lake, Calif.	5,790	2,631	607
8	Lockheed Missiles & Space Co. Inc.*	Sunnyvale, Calif.	5,394	7,500	1,200
9	Bell Communication Research, Bellcore*	Red Bank, N.J.	4,115	2,500	350
10	Aetna Life & Casualty Co.*	Hartford, Conn.	3,875	3,000	0
11	Sprint*	Overland Park, Kan.	3,800	21,000	100
12	Martin Marietta*	Littleton, Colo.	3,745	1,834	350
13	Recom Technologies	Moffett Field, Calif.	3,700	1,000	1,500
14	Dow Chemical Co.	Midland, Mich.	3,670	5,500	1,000
15	Rhode Island Hospital	Providence, R.I.	3,669	2,000	200
16	Merck & Co. Inc.	Rahway, N.J.	3,625	3,000	300
17	Aetna Life & Casualty Co.*	Middletown, Conn.	3,495	6,000	10
18	EG & G Rocky Flats Inc.	Golden, Colo.	3,450	3,500	300
19	Southern California Ophthalmology	Los Angeles, Calif.	3,266	3,266	15
20	NASA Johnson Space Center	Webster, Texas	3,035	9,000	N/A
21	OmniSwitch Inc.	Plano, Texas	2,845	600	2,000
22	National Institutes of Health	Bethesda, Md.	2,805	10,000	300
23	Hughes Aircraft Co., Ground Systems Group*	Fullerton, Calif.	2,795	650	350
24	Northern Telecom Canada*	Ottawa, Ontario	2,782	N/A	N/A
25	Harris Corp.	Melbourne, Fla.	2,530	3,000	800

*Locations with multiple sites. N/A = not available. Please see methodology for explanation of rankings.

Methodology

The 1993 MacWEEK 200 and Education 50 are based on phone surveys that took place over an eight-week period, from Feb. 11 to April 16. Using computer-generated lists of the largest Macintosh sites from the MacWEEK subscriber file, as well as from contacts supplied by Computer Intelligence, a market research company in La Jolla, Calif., 13,317 phone calls were made. A total of 1,379 interviews were completed at qualified government, commercial and educational work locations.

Sites were excluded from the survey if their principal product or service is the manufacturing or sale of Macintosh computer products. Educational sites counted only those Macs owned by the organizations, not those personally acquired by students or faculty.

Sites are ranked based on the total number of Macs installed. Ties were broken based on the number of Quadras and Centrises installed.

Respondents were administered a standard questionnaire after being screened, to ensure they were the individuals with the most-accurate information about the Mac installation at their site. Only individuals with the most-accurate information completed the interviews.

Parallax Marketing Research Inc., an independent market research company in San Francisco, was responsible for all survey operations, from making initial contact with respondents to tabulating survey results. Procedures followed established market research standards.

Every effort was made to ensure that the MacWEEK 200 and Education 50 are the most-accurate listings of their kind.

average of 4,412 per site. Macs represent 38 percent of this total.

Purchase plans. Judging from their purchase plans, MacWEEK 200 sites are looking for increased processing power and portability in their Macintoshes. Among desktop models, the Quadra is the most popular planned purchase, with 65 percent of sites intending to acquire one within the next 12 months. Fifty-eight

percent plan to buy Centris machines.

Looked at another way, future interest in each model can be measured by its share of the total purchase plans. The high-end Quadra and Centris models alone, for example, will account for 46 percent of new Mac acquisitions.

If the sites surveyed stick to their plans, Apple's compact models will decrease in popularity among the top 200: Only 17 percent plan to acquire any Mac Classic model within the next year. The midrange Macs fare better, with 36 percent of the sites planning to acquire IIci, IIvx or IIsi models. (During the course of this survey, Apple discontinued the Mac IIci and Mac IIsi models.) Thirty-three percent of the sites will add the LC II or LC III in the upcoming 12 months, which will account for 10 percent of next year's Macs.

The PowerBooks, including the Duos, will be increasingly important components of the Macintosh mix at these large sites. While PowerBooks make up only 6 percent of the MacWEEK 200 installed base, they represent 25 percent of all Macs planned for purchase.

Sixty percent of sites plan to acquire stand-alone PowerBooks, while almost the same percent (57) intend to buy Duos. These sites plan to split their Mac-portable purchases about evenly between the two series, which will account for 12 percent and 9 percent of the upcoming year's acquisitions, respectively. Almost half the sites (47 percent) indicate purchase plans for the new color PowerBook 165c, and the color PowerBooks represent 4 percent of planned acquisitions.

Overall, planned purchases among the MacWEEK 200 will result in a 15 percent increase in their current installed base, excluding retirements. □

Sites with various Mac models installed

	Average number	Percentage of sites
IIci/IIsi	570	98%
Quadras/Centrises	83	92%
PowerBooks	91	91%
Other Mac IIs	423	89%
Classics/SE	256	89%
SE/30	117	84%
Other Macs	159	67%
LC	108	67%
Duos	28	61%
IIvx	105	51%

Base: All MacWEEK 200 sites.

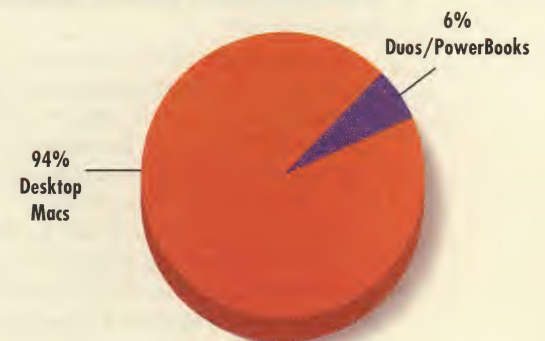
What is a site?

The MacWEEK 200 and Education 50 rankings are based on the number of Macintoshes at a site, not at a company or organization. This distinction is a frequent cause of confusion for readers comparing the rankings.

A site is defined as all buildings and offices in the same vicinity, but not buildings in other parts of town or other cities. A site may be a building, several adjacent buildings, or an industrial park or campus.

Because a site is defined geographically, companies or organizations with very large numbers of Macs dispersed among many small sites aren't found in the rankings. For example, many school districts interviewed had thousands of Macs but were not contenders for the Education 50 because they were spread over hundreds of sites across an entire city or county.

Desktop Macs vs. Duos and PowerBooks



Base: Total number of Macintoshes installed.

Companies not listed

While we make every effort to ensure that the MacWEEK 200 and Education 50 surveys are as comprehensive as possible, many factors affect their results.

In some cases, respondents are unable to supply necessary information within the interviewing period. For example, the University of Texas at Austin, the top 1992 education site with more than 13,000 Macs, was unable to gather all the data before the deadline; therefore, it is missing from the 1993 list.

In other cases, we were simply unable to find a respondent who knew how many Macs were installed. Procter & Gamble Co. reported more than 4,320 Macs at its company headquarters in 1992. This year we could find details on only one of the 12 buildings at that work site.

Some organizations have institutional policies against giving out information on computers installed. So, sites we suspect have sufficiently large Mac installations to make the list — including several Boeing Co. locations in Washington; Federal Express Corp. headquarters in Memphis, Tenn.; and Delco Electronics Corp. in Kokomo, Indiana — refused to participate.

Corporate downsizing and acquisitions also affect the composition of the list from year to year. For instance, a General Dynamics Corp. facility on the 1992 list has since been acquired by Hughes Aircraft Co. and no longer appears as an independent site.

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
26	Science Applications International Corp.*	McLean, Va.	2,500	2,200	300
27	Raychem Corp.	Menlo Park, Calif.	2,470	2,470	200
28	Sprint*	Shawnee Mission, Kan.	2,454	11,000	100
29	Los Alamos National Laboratory	Los Alamos, N.M.	2,410	1,200	1,000
30	Union Carbide Chemicals and Plastics Inc.	Charlestown, W. Va.	2,400	1,200	N/A
31	U.S. Navy, Naval Research Laboratory	Washington, D.C.	2,332	N/A	N/A
32	Electronic Data Systems Corp.*	Troy, Mich.	2,245	10,000	1,500
33	University of Texas, MD Anderson Cancer Center	Houston, Texas	2,240	3,500	15
34	Duke University Medical Center	Durham, N.C.	2,230	5,400	540
35	The World Bank	Washington, D.C.	2,200	7,000	150
36	ESL TRW Inc.	Sunnyvale, Calif.	2,185	100	250
37	GTE Government Systems Corp.*	Waltham, Mass.	2,158	1,000	150
38	Lawrence Berkeley National Laboratory	Berkeley, Calif.	2,139	1,850	1,035
39	Seattle First National Bank	Seattle, Wash.	2,137	2,000	N/A
40	Chevron Chemical Co.	San Ramon, Calif.	2,110	3,000	10
41	J.P. Morgan Guaranty Trust	New York, N.Y.	2,100	N/A	N/A
42	Boeing Co., Boeing Computer Services Division*	Huntsville, Ala.	2,100	3,500	400
43	JWP Information Systems Inc.*	Spenceport, N.Y.	2,070	2,500	200
44	US West Communication Inc.*	Denver, Colo.	2,067	7,953	2,655
45	Rockwell International	El Segundo, Calif.	2,040	822	75
46	E.I. du Pont de Nemours & Co.	Wilmington, Del.	2,001	1,000	155
47	State Farm Insurance	Bloomington, Ind.	2,000	N/A	N/A
48	NASA-Langley Research Center	Hampton, Va.	2,000	3,000	1,000
49	Teledyne Brown Engineering Inc.	Huntsville, Ala.	1,995	600	200
50	Martin Marietta*	Oakridge, Tenn.	1,974	15,000	740

*Locations with multiple sites. N/A = not available.

Top 5 sites: Plentiful Macs meet specific user needs

To make it to the top of the MacWEEK 200 list, the five largest sites boasted from 6,000 to more than 17,000 systems. And for most of these companies, the number is rising.

By Connie Guglielmo

The days when the Macintosh was a back-door commodity are long gone. A survey of the five top-rated sites in the MacWEEK 200, which together are home to almost 50,000 Macs, shows that Macs are not only being welcomed at the back door but also ushered in the front, side and any other doors open to them. To make it to the top of the list, these sites — Eastman Kodak Co., Lawrence Livermore National Laboratory, Westinghouse Savannah River, the Jet Propulsion Laboratory and Pacific Bell Co. — boasted Mac populations from more than 6,000 to more than 17,000 systems. For most, the number is increasing daily.

The reasons for the Mac's continued success in corporate America have not changed very much since the technology was introduced in 1984, although the technology itself has undergone significant advances. "A lot more Macs are being bought," said Dieter Fuss, program leader for the Distributed Computing Support Program at Lawrence Livermore Labs, "because it's easier to learn to use and to become familiar with the applications."

Standards: Hardware first. Most of the five sites have defined minimum system configuration requirements.

Kodak, the No. 1-rated site with 17,630 Macs, also held that spot in the 1992 MacWEEK 200 with 15,745 Macs. For this insti-

tution, an 8-Mbyte machine with an 80-Mbyte hard disk is the "absolute minimum" configuration bought today, according to Rick Eder, Kodak senior coordinator of information technology. Users can purchase any model Mac as long as it uses a 68030 microprocessor; Kodak may standardize on 68040-based Macs, depending on the pricing of those systems in the next year, Eder said. "Our philosophy has been to set the technical minimum standards and accept the machines that meet those minimums."

Westinghouse Savannah River, which recently announced its decision to phase out its Macs (see story, Page 46), has defined three levels of hardware standards for its administrative, management and technical-scientific users, according to senior analyst Marty Young. The minimum configuration is a 4/40 system, with technical-scientific users starting with 8/40 systems.

Decisions about which hardware to buy at the Jet Propulsion Laboratory, on the other hand, are left up to the engineers working on group projects. "We have not set standards; we don't set limits," said Marco Covarrubias, JPL associate contract negotiator for procurements. He said the company plans to purchase an addi-



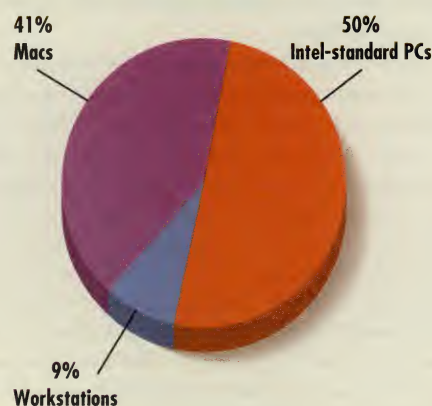
BOB RINA

Marco Covarrubias says that at the Jet Propulsion Laboratory hardware decisions are left up to the engineers who will use the machines. JPL is home to 6,875 Macs.

tional 1,400 Macs — mostly Quadras, Centrises and PowerBooks — in the next year. "Since we're under government contract, every project determines what the best tools are. If a DOS-based system will better suit their needs, that's their choice." (For the record, at these sites the minimum IBM PC and compatible configuration used is Intel 386-based.)

Individuals and departments at Lawrence Livermore can also decide which systems to purchase, but Fuss' department tries to make recommendations and steer users toward systems that can be easily integrated into the site's cross-platform environment of Macs, PCs and Unix workstations. "We want to try to limit the number of machines you have to support in the laboratories,"

Breakdown of 12-month purchase plans by platform



Base: Total number of personal computers and workstations planned for purchase.

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
51	Citibank	Long Island City, N.Y.	1,934	1,900	24
52	Transcanada Pipelines Ltd.	Calgary, Alberta	1,917	250	0
53	McDonnell Douglas Space Systems	Huntington Beach, Calif.	1,858	1,858	75
54	AT&T Co.	Old Bridge, N.J.	1,855	10,000	2,500
55	Bechtel Group Inc.	San Francisco, Calif.	1,845	3,500	20
56	J.P. Morgan Securities	New York, N.Y.	1,824	10,000	500
57	MIT Lincoln Laboratory	Lexington, Mass.	1,720	2,000	100
58	Ernst & Young*	New York, N.Y.	1,690	1,200	N/A
59	Naval Air Warfare Center	Point Mugo, Calif.	1,650	4,500	100
60	U.S. Department of Energy	Dallas, Texas	1,616	700	900
61	Pacific Gas & Electric Co.	San Francisco, Calif.	1,585	15,000	510
62	Naval Underwater Weapons Center	New London, Conn.	1,570	1,500	300
63	Syva Co., a division of Syntex Corp.	Palo Alto, Calif.	1,517	3,000	20
64	Polaroid Corp.	Waltham, Mass.	1,511	500	50
65	Raytheon Co.*	Needham, Mass.	1,500	300	700
66	Northern Telecom Inc.*	Richardson, Texas	1,495	100	N/A
67	Hughes Aircraft Co., Hughes Space and Comm. Group	Los Angeles, Calif.	1,485	700	200
68	BBN Advanced Simulation	Cambridge, Mass.	1,470	400	600
69	Hoffmann-La Roche Inc.	Nutley, N.J.	1,460	5,000	10
70	BP Exploration Inc.	Houston, Texas	1,460	200	50
71	Salomon Inc.	New York, N.Y.	1,450	4,000	2,200
72	U.S. Army Missile Command	Arsenal, Ala.	1,440	4,500	50
73	Ameritech Services Inc.	Southfield, Mich.	1,425	2,000	400
74	Arco Alaska Inc.	Anchorage, Alaska	1,422	210	125
75	Battelle Pacific Northwest Laboratories	Richland, Wash.	1,412	4,100	650

*Locations with multiple sites. N/A = not available.

Fuss said. "We do try to figure out what are the most competitive products. Then we make it easier for people to buy those products [through purchasing agreements]. We don't like clones of any kind."

Flexible software standards. On the software front, the question of standards is not as cut and dried. Kodak has a standards list for applications that run on Macintosh and Windows. But the company, like most sites, said that rather than company-defined standards, users have created de facto application standards.

"There's nothing that says you have to use a particular application," said Lawrence Livermore's Fuss. "I just know that a lot of people use Microsoft Word, and some large number uses Excel."

Westinghouse's Young said the company has license agreements for certain applications (which he declined to name). "I wouldn't say they were standards. Our purchasing department was able to look at buying habits and based on that, to negotiate license agreements for a word processing program, spreadsheet, drawing program, forms package and terminal emulator."

Applications that stand the most chance of success at Westinghouse, Young said, "must work cross-platform."

Macs vs. PCs vs. everything else. One thing all five sites prove is Fortune 1,000 companies and large government contractors are heterogeneous when it comes to computing platforms: No matter how plentiful, Macs share network space with large populations of PC-based systems and workstations. In fact, among

the top sites — including No. 1-rated Kodak — the Mac still falls short of the combined PC and workstation population.

Price, performance and preference are all factors that come into play when choosing a computer platform — a choice that is by and large left up to individual departments.

"Is the ratio going to stay 2-to-1? My crystal ball is not that good," said Eder of Kodak, where PCs outdistance Macs at a ratio of 2-to-1. "With the relative size of the base, even if we stopped buying PCs it would still take a few years to shift the ratio. And given that earlier in the year, when [Kodak] was feeling some price sensitivity and Intel platforms were so inexpensive compared to Macs, it's hard to say."

While Apple has moved in the past two years to price its systems more competitively, price-performance remains an issue, especially when Macs are compared on a performance basis to 386- and 486-based PC systems. But at Pacific Bell, which houses its vast customer database on Unix-based systems, PC purchases are a matter of preference. "We live in the Unix world here," said Jeff Griffin, a Pacific Bell



Pacific Bell reported 6,750 Macs bringing it to the No. 5 slot on the MacWEEK 200 list. Jeff Griffin, pictured here, is an analyst for systems technology.

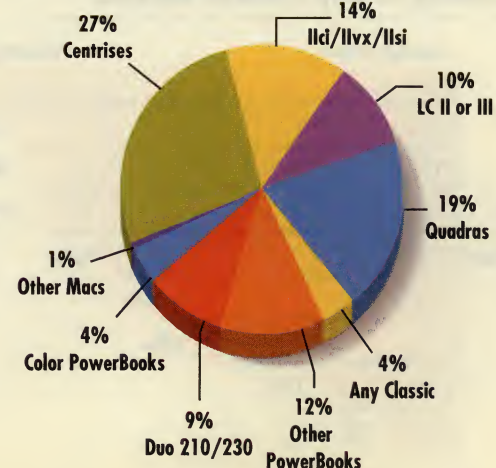
analyst for systems technology. "Command line on the PCs doesn't scare people at all."

Support. While most of these companies accept the diversity of platforms, that means there are more platforms to support. All five sites said they maintain in-house staffs responsible for handling hardware repair, system maintenance, user support and upgrades. Support staff members, for the most part, are jacks-of-all-trades: While they have gone through Apple's authorized training and are able to deal with Mac problems, they are also being called on to handle PC and workstation support as well. At Westinghouse Savannah River, the electronics repair shop has the added responsibility of maintaining all technical and electronic equipment being used at the 300-square-mile site, as varied as computers and radios, according to Young.

Kodak has found that even maintaining older Mac (and PC) models can be a strain on its support services. "We try to encourage an active replacement of old Macs over a reasonable time frame," Kodak's Eder said. "We still haven't put our finger on the generations of machines we can support. We're still trying to zero in on that one."

See Top 5, next page

Breakdown of 12-month purchase plans by Mac model



Base: Total number of Macintoshes planned for purchase.

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
76	SRI International	Menlo Park, Calif.	1,405	1,268	604
77	Dow USA Texas Operations	Freeport, Texas	1,355	3,100	150
78	Evans & Sutherland Computer Corp.	Salt Lake City, Utah	1,350	200	N/A
79	NASA	Huntsville, Ala.	1,335	2,000	500
80	U.S. Geological Survey, Department of Interior	Denver, Colo.	1,300	2,000	1,500
81	Argonne National Laboratory	Argonne, Ill.	1,300	1,250	200
82	Ernst & Young*	Toronto, Ontario	1,300	203	1
83	Du Pont Merck Pharmaceutical Co.	Wilmington, Del.	1,290	1,000	0
84	Bank of Boston	Boston, Mass.	1,270	2,000	125
85	Bellcore*	Red Bank, N.J.	1,255	300	100
86	State of Kansas	Topeka, Kan.	1,225	4,000	25
87	Booz, Allen & Hamilton Inc.	McClean, Va.	1,224	600	200
88	BP Exploration Alaska	Anchorage, Ala.	1,220	5	70
89	Sandia National Laboratories*	Livermore, Calif.	1,210	600	350
90	Loral Western Development Lab	San Jose, Calif.	1,206	600	51
91	NASA Lewis Research Center	Cleveland, Ohio	1,198	4,500	1,100
92	Naval Surface Warfare Center, Cardrock Division	Bethesda, Md.	1,179	3,000	350
93	Network Resources	Rockland, Mass.	1,145	125	15
94	Fidelity Investments	Boston, Mass.	1,135	900	600
95	John Deere Product Engineering Center	Waterloo, Iowa	1,132	710	35
96	Grumman Aerospace	Bethpage, N.Y.	1,127	4,000	2,200
97	NRAD, Naval Command Control & Ocean Surveillance Ctr.	San Diego, Calif.	1,125	4,500	729
98	Eastman Kodak Co.*	Pittsford, N.Y.	1,123	10,000	10
99	Hydro Quebec	Montreal, Quebec	1,120	9,900	600
100	Raytheon Co.*	Framingham, Mass.	1,115	1,000	225

*Locations with multiple sites. N/A = not available.

Top 5

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Out to pasture? When asked what happened to older model Macs and if they were retired, most of the respondents at the five sites laughed and described aging Mac populations that date back to Mac 512Ks. Westinghouse Savannah River noted that some of its users still start up old Apple Lisas (and Lisas that were upgraded to Macintosh XLs).

All five sites said that Macs continue to trickle down the organization hierarchy to

users who either have no computer system or want access to a Mac. "Very few Macs have been retired," Young said. "We started buying them in 1985, and we have been extremely responsible about maintaining them."

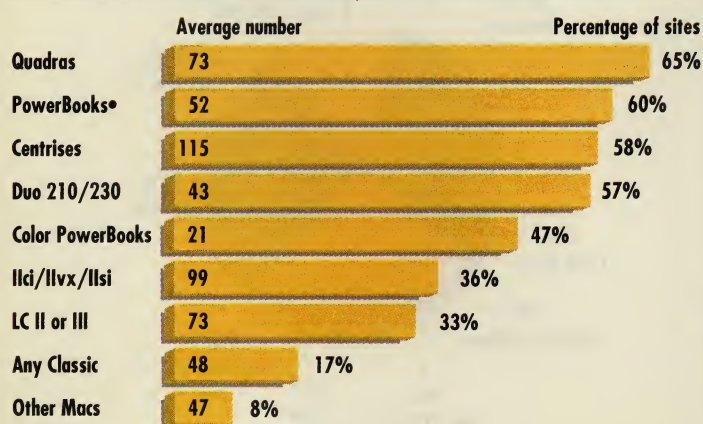
Kodak's Eder

added: "We can open up a Mac museum. We're still trying to figure out the best way to roll [older Macs] off the books: donating them or selling them to employees."

System 7. A year ago, many large sites were still evaluating or just starting to upgrade to System 7. Today, System 7 is the standard OS on Macs at those sites — at least those Macs able to take advantage of the OS. About 90 percent to 95 percent of the Macs at Savannah River are running System 7, but at Pacific Bell, Griffin said, "the Macs with enough memory are, the ones without enough memory aren't."

Complaints? Suggestions? Those MacWEEK spoke with at most of the five sites said the one thing they would like to see happen to the Mac in the near future is improved speed across the product line. But that hasn't stopped some engineers, such as those at JPL, from pushing the Mac to the limits, said JPL's Covarrubias. "These guys try to make them squeal as much as possible. They put everything in them — tape drives, SyQuest drives, accelerators, 72 Mbytes of memory — and try to take them to the limits of the specification. Sometimes I wonder if you can actually do all this to a computer." □

Sites planning to buy various models



Base: All MacWEEK 200 sites. *Excluding Duos and color models.

Some sites say 'So long, Mac'

While industry experts say companies standardizing on the PC may be a PR setback for Apple, the market impact is likely to be negligible.

By Connie Guglielmo

At the same time it is being ushered in at Fortune 1,000 companies, the Macintosh seems to have worn out its welcome at a few sites that were once prominent endorsers of the technology.

Almost a year after Aetna Life & Casualty Co. announced it would stop buying Macs in favor of IBM PS/2 systems running Microsoft Windows, the word is out that Boeing Commercial Airplane Group of Renton, Wash., also decided last June to discontinue Mac purchases and to standardize on IBM PC and compatible-based technology and Windows.

In addition, Westinghouse Savannah River, a large contractor for the Department of Energy, decided in March to halt all new Mac purchases while the company re-examines its computer requirements. Reports are also circulating that Detroit-based General Motors Corp. in March issued a companywide directive prohibiting Mac purchases (see MacWEEK, April 26). Instead, sources said, the

auto maker plans to replace its Mac population over time with Intel-based PCs running Microsoft's upcoming Windows NT.

Three of the four sites are among the largest Mac installations in the country: Westinghouse Savannah River placed third on the MacWEEK 200 survey with 8,345 Macs, while Aetna offices in Hartford and Middletown, Conn., ranked 10 and 17, respectively, with a combined Mac population of more than 7,000 systems. The Boeing Group (which declined to take part in the survey) has an inventory of nearly 6,000 Macs, according to an internal company memo.

Analysts seem sanguine. But while industry analysts agreed the decisions seem to be a public-relations setback for Apple, they said the market impact, if any, was negligible. "I wouldn't call it the beginning of the end," said Dan Ness, a senior industry analyst at market research company Computer Intelligence of La Jolla, Calif. "It's not something that Apple likes to hear, but it's the reality that there have always been more PCs than Macs out there. ... [The fact that] a few companies have chosen another path is not earth-shattering."

Doug Cayne, group vice president and general manager of The Gartner Group's Bay Area Research Center in Santa Clara, Calif., went further, calling the decision to standardize on any single platform — whether PC or Macintosh — "shortsighted."

"You have to step back and look at why companies got into diverse platforms in the first

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
101	Transalta Utilities Corp.	Calgary, Alberta	1,109	225	42
102	Varian Association Inc.	Palo Alto, Calif.	1,108	2,800	150
103	General Electric Rental/Lease	Kent, Wash.	1,100	1,000	200
104	Hughes Aircraft Co., Missile Systems Group*	Tucson, Ariz.	1,100	1,600	45
105	McDonnell Douglas Aerospace West	Santa Ana, Calif.	1,100	400	N/A
106	Westinghouse Electric Corp.	Gambrills, Md.	1,095	2,000	100
107	LL Bean Inc.	Freeport, Maine	1,082	166	0
108	Charles Stark Draper Laboratory Inc.	Cambridge, Mass.	1,055	600	200
109	General Electric Co.†	Syracuse, N.Y.	1,050	1,000	800
110	General Dynamics Corp., Electric Boat Division	Groton, Conn.	1,042	1,000	695
111	Advanced Tech. Battle Management, Hanscom AFB	Bedford, Mass.	1,025	350	75
112	Dorsey & Whitney	Minneapolis, Minn.	1,011	5	0
113	JWP Telecom Inc.*	King of Prussia, Pa.	1,009	2,500	60
114	Detroit Edison Co.	Birmingham, Mich.	1,000	150	25
115	Sandia National Laboratory*	Albuquerque, N.M.	1,000	700	100
116	Applied Biosystems Inc.	Foster City, Calif.	983	300	25
117	The Hitchcock Clinic	Lebanon, N.H.	982	20	1
118	Electric Power Research Institute	Palo Alto, Calif.	977	550	3
119	Cleveland Clinic Foundation	Cleveland, Ohio	975	4,400	400
120	GTE Government Systems*	Mountain View, Calif.	964	500	50
121	U.S. Surgical Corp.	Norwalk, Conn.	949	700	150
122	KPMG Peat Marwick Thorne*	Toronto, Ontario	939	231	0
123	Rand	Santa Monica, Calif.	933	554	217
124	American Airlines Inc.	Dallas, Texas	932	7,500	1,000
125	EG & G Idaho Inc., National Engineering Lab	Idaho Falls, Idaho	928	4,500	300

N/A = not available. *Locations with multiple sites. †After interviewing was completed, this site was purchased by Martin Marietta.

place," Cayne said. "The Type A companies were the leading-edge adopters who took on something new because it gave them a competitive advantage at a particular point in time. But when you homogenize, you reduce yourself down to the least common denominator."

"We believe things are going toward increased heterogeneity in the future and that companies will have to learn to manage their technology assets like a stock portfolio," he said. "Some things are long-term, but sometimes you have to take a gamble. If you manage the portfolio well, you can benefit from being a pioneer."

So what would motivate companies such as Boeing and Aetna to standardize on a platform at this time? "Enterprisewide technology decisions usually have political overtones," Cayne said. "You probably have someone saying, 'Wouldn't be it nice to standardize on one client-server tool and convert to one desktop machine, and then we'll be set for life.' It's an appealing solution, but it's impractical. By the time you made the transition, a process that could take from 12 to 24 months or more, the technology you standardized on will have gone through several iterations."

Apple speaks. Jerry Malec, vice president and general manager of Apple's Enterprise Markets Division in Atlanta, also downplayed the effect the decisions will have on the Mac's long-term future among corporate clients. "The next few years in enterprise, large business and federal government decision making will be rewarding for Apple. ... We will grow in units 40 percent year over year," Malec said. "What distinguishes 1993 and 1994 from 1992 is the significant number of

development tools that allow people to migrate from [mainframe] environments and to redesign legacy applications. We have an architectural approach that accommodates both Mac and non-Mac systems. Those development tools did not exist 12 to 14 months ago, and that's the time frame when some of these [standardization] decisions were made."

Aetna and Boeing. Despite their large Mac installations, Aetna and the Boeing Group have even larger installed bases of PCs. The two Aetna sites surveyed claim an installed base of 9,000 PCs, while the Boeing Commercial Airplane Group houses more than 40,000 PCs, according to an internal company memo distributed to employees by Walt Braithwaite, vice president of information technology. Braithwaite did not respond to requests for an interview.

Like Aetna, which selected the PC as part of the company's Consistent Office unified desktop strategy, Boeing Commercial Airplane Group decided it needed to standardize on a single platform.

While Aetna's decision, according to industry reports, was based on communications and compatibility problems the company had integrating Macs in its host-based environment, Braithwaite cited the cost of supporting two desktop environments as the primary reason for standardizing on the PC.

In his memo, "What did you hear? Read on for the truth about Macs," Braithwaite wrote that "studies confirmed that supporting two distinctly different desktop computing platforms significantly increases life-cycle costs. The issue of preference is well understood, but because The Boeing Company must absorb all



ROB NELSON/BLACK STAR

costs related to computing acquisition and support, absorbing this cost impacts everyone."

The move toward PC standardization was also driven by the availability of formerly Mac-only applications under Windows, especially the "graphics applications that long have been a strong Macintosh advantage."

The Braithwaite memo also stated that "the fact that PCs are available from multiple suppliers while the Macintosh is available from only one runs contrary to the computing architecture principles that promote a commodity approach, open systems and reduction in proprietary solutions."

Like Aetna, the Boeing Group will continue to support the installed base of Macs "until they approach obsolescence," but it will not approve wholesale upgrades or acquisitions of new Macs or Mac software. The transition from Macs to PCs will be gradual, with the Braithwaite memo stating that the company's objective is "to phase out Macintoshes at a rate of 20 percent a year."

In flux. As part of its effort to standardize, Westinghouse Savannah River has also stopped new purchases and upgrades of Macs — but it has not yet decided what the standard platform will be.

While a memo circulated by a Department of Energy official stated the site's standard should be "compatible with the current platform established at Department of Energy headquarters

See Pullout, next page

12-month purchase plans for desktop Macs vs. Duos and PowerBooks



Base: Total number of Macintoshes planned for purchase.

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
126	The Mayo Clinic	Rochester, Minn.	925	3,100	240
127	Allen-Bradley Co.	Milwaukee, Wis.	924	550	250
128	Newbridge Network Corp.	Kanata, Ontario	920	150	40
129	NYNEX	Boston, Mass.	916	10,000	20
130	US West Marketing Resources Group Inc.	Englewood, Colo.	912	300	5
131	KPMG Peat Marwick*	San Francisco, Calif.	910	400	0
132	United States Air Force	San Antonio, Texas	910	700	1
133	Princeton University Plasma Physics Laboratory	Princeton, N.J.	905	350	30
134	State Comptroller of Public Accounts	Austin, Texas	900	2,100	11
135	General Dynamics Corp., Space Systems Division	San Diego, Calif.	900	300	130
136	Boeing Computer Services*	Wichita, Kan.	900	3,000	100
137	Northern Telecom Ltd.*	Brampton, Ontario	898	N/A	N/A
138	Hughes Santa Barbara Research Center	Goleta, Calif.	888	250	110
139	Philip Morris USA	Richmond, Va.	883	1,600	6
140	Home Box Office, Information Systems Division	New York, N.Y.	877	500	6
141	Southern California Edison Co.	Long Beach, Calif.	873	8	21
142	Life Scan Inc.	Milpitas, Calif.	872	250	10
143	U.S. Air Force, Falcon Air Force Base	Colorado Springs, Colo.	860	1,900	50
144	SmithKline Beecham Clinical Laboratories	King of Prussia, Pa.	846	2,000	50
145	Naval Surface Warfare Center	Dahlgren, Va.	842	4,600	400
146	GTE Data Services Inc.	Temple Terrace, Fla.	840	1,800	100
147	McDonnell Douglas Aerospace*	Houston, Texas	830	100	200
148	Sterling Winthrop Inc.	Collegeville, Pa.	829	900	50
149	Lehman Brothers Inc.	New York, N.Y.	821	2,000	200
150	Science Applications Intl. Corp. Range Systems*	San Diego, Calif.	820	800	200

*Locations with multiple sites. N/A = not available.



TOMMY THOMPSON/BLACK STAR

The stated position of Westinghouse Savannah River, a Department of Energy contractor, is that it will buy from the lowest bidder that meets its computer needs.

Pullout

From previous page

(IBM compatible)," a department spokesman said Westinghouse is still in the process of evaluating its computer requirements.

"We are going forward with our plans to evaluate our computer system and to find out what would be the most cost-effective system and would provide the most uniformity," said Jim Giusti, an Energy Department spokesman for the Savannah River site. "We will be buying computers from whoever provides us with the lowest bid and who can offer a system that meets our computer requirements. ... Every vendor will have an opportunity to bid," he said. "If Mac can provide us with the lowest bid, then we'll buy that system. Our budgets are becoming smaller and tighter, and so we are looking for more-efficient ways to spend our procurement dollars."

If the site does decide to standardize on the PC, Westinghouse Savannah River will continue to "use Macs and to not replace them until the end of their life cycle," said Giusti, who added that the majority of new computer systems bought recently were Macs.

Giusti said the company plans to fill Mac orders that were in the pipeline before the hold was placed in March. In fact, according to Malec, Apple received a contract from Energy Department headquarters in April for "an unlimited specified bid that could be up to \$7 million in volume."

Going forward. As evidence of the Mac's success in companies looking for client-server solutions, Malec cited Apple's success in signing on companies such as Allied Signal, Martin Marietta and Monsanto Co. The Mac's development tools also convinced Avis to choose the Macintosh as the platform for the client-server application that handles the company's car-reservation system at its central office in Tulsa, Okla. The project added 700 Macs to the company's existing inventory of 200 Macs.

Called TAFT (Tulsa Advanced Function Terminal), the reservation system is expected to be completed in May, according to Peter Tittler, Avis vice president of networks and technology in Garden City, N.Y. "We looked at the Mac, at Windows and OS/2, Unix and X-terminals," he said. "Our feeling was that the Mac was equally priced or less expensive; the Mac OS, System 7, was more mature than those other systems; and that all the components, the communication drivers, all fit together."

"We see the advantage in having the same company building the hardware and software," he said. "They provided an integrated solution that fit together with no conflict. In our mind, we just knew it was the superior solution." □

Macs move on financial institutions

The world's most powerful financial institutions find Macs appealing because of easy networking capabilities, localized software and the potential of remote access.

By Mitzi Waltz

There's no problem finding Macs at the offices of some of the world's most powerful financial institutions. In fact, 12 percent of the commercial sites in the MacWEEK 200 are financial companies. Some of those within the top 100 on the list are The World Bank, Seattle First National Bank, J.P. Morgan Guaranty Trust, Citibank and the accounting firm Ernst & Young. This group has a combined total of nearly 10,000 Macs.

Managers at these companies reveal that the Mac has a special appeal at institutions with international operations because of easy networking and localized software.

"As a multilateral development bank, we have one of every ethnic group and one of every computer system," said Tom Poole, information specialist at The World Bank. "We're in the process of launching an enterprise network, and the Mac has worked smoothly because it has great connectivity with all our other systems."

About half of the World Bank's 2,200 Apple machines are networked via Ethernet, with the others linked in smaller AppleTalk networks connected to a backbone through routers.

"We have about 550 that have Ethernet and IP

(Internet Protocol) numbers," Poole said.

At Ernst & Young, server-based networking is the trend, according to Vernon Huggins, a purchasing agent for the firm. Mac servers compete with IBM PCs and compatibles running Novell Inc.'s NetWare.

Going mobile. Mobile computing and telecommunications are hot topics at almost all financial sites. "Everyone wants a PowerBook," Huggins said. "A lot of users don't know about [Apple Remote Access] yet, although on the technical side we do call in and check for messages. But I see a move toward remote access — not sudden but slow and gradual."

The World Bank has already made that move, Poole said. "We have several hundred PowerBooks. Lots of people are working at home this morning, drinking java and probably getting as much done as they would here in the office. We've tried to discourage the Duo. It seemed like a waste of resources having a machine sitting here idle when someone was on mission." Salomon Inc. has equipped several PowerBooks with cellular phones and fax modems, said one anonymous Mac manager. "We're also very eager to see the Newton and its derivatives. It's not so much that we need mobility for application-oriented things, such as sales-force automation — our people just need the ability to keep in touch constantly and work wherever they are," he said.

At Lehman Brothers Inc., an investment banking company, Computer Graphic Specialist Gerard Cooper is making innovative use of AppleTalk Remote Access (ARA). His boss is about to embark on a trip to Hong Kong and Tokyo, during which he will give a multimedia presentation. At

Quadras the low end at J.P. Morgan

Although Quadra models represent the high end of Apple's personal computer product line, at least one company considers them its lower-end alternative among its hardware platforms.

As vice president in charge of J.P. Morgan Securities' Corporate Technology division, Tom Leder orders Quadras for his Mac-using employees. His group has roughly 600 Quadras among nearly 2,000 Macs. "We've been buying mostly Quadras and PowerBooks for the past year," Leder said, "along with a couple of Centris for mail servers." The Macs run on a multiprotocol network that supports Novell Inc.'s NetWare, AppleShare and Network File System.

"We use Quadras because our alternative workstation is the Sun SPARCstation 10," Leder said. "The Mac is the low-end alternative." Leder's group orders model 800 Quadras exclusively. "We had never gone for 900s or 950s in a big way because they were difficult boxes to service and acquire," he said.

Macs and Suns do the job. Although J.P. Morgan itself has some 10,000 IBM PC-compatible systems, Leder's group uses only Macs and Sun workstations. "We're looking to get rid of as many PCs as we can and standardize on either Macs or Suns so we'll have fewer technologies to support and have one fewer platform out there for our applications."

The Corporate Technology division develops the overall

technology strategy for this commercial bank holding company, evaluating and enforcing technology standards for different applications. "Our work is involved with the investment bank and securities subsidiary," Leder said, "which is about 20 percent of the people at J.P. Morgan and about one-third of the revenues. Altogether, the subsidiary employs about 2,000 people in New York and supports a dozen other offices worldwide."

Although they're linked by a network, using Unix workstations and Quadras presents cross-platform compatibility issues when different users produce files on different machines. "We're a Microsoft Office shop for personal-productivity applications on the Mac," Leder said, "and Microsoft isn't being a sport in offering those products for the SPARC."

Macs for productivity. There are far more personal-productivity application choices for the Mac platform, Leder said, but when it comes to heavy-duty market data services and financial-analysis tools, he said, "Wall Street has pretty much standardized on Unix."

So while Unix workstations handle vertical-market applications for J.P. Morgan's traders and analysts, the bread-and-butter productivity work in Leder's group is done on Macs. Although cheaper DOS-compatible 486 boxes are available, Leder is sticking with Quadras because they're easier to use, less expensive to support and, he said, "in general, the fact that our Mac users are the happiest." — By Charles Rubin



Tom Poole, information specialist at the World Bank says the Macs work well in his operation because of their "great connectivity with all our other systems."

night, Cooper will be "on stand-by" at home in case his boss needs last-minute changes that he can make via ARA.

Security measures. Security is another high-profile issue. At BankAmerica Corp., said Mac manager Gary O'Shaughnessy, hardware and software measures have been put in place but he declined to name specific products.

Salomon has opted for the SecurID system from Security Dynamics Inc. SecurID, which supports ARA servers from Shiva Corp. and Cayman Systems Inc. and features dial-back calling and authentication, is on-line and "operating flawlessly," he said. "The Mac doesn't have the most advanced security mea-

sures right out of the box," but the Cayman GatorLink/SecurID combo "is making our security people very happy."

Cooper said security fears make some employees reluctant to join networks. "I set up a network for secretaries in the corporate division, and they complained that they didn't want to be linked," he said. "We got DiskLock from Fifth Generation Systems [Inc.] and they loved it—you can see if there's been any attempt to access your machine, and there are

folder locks so they can lock away sensitive files."

So far, he noted, a corporatewide Ethernet network has met much resistance from a few employees who are still linked only via small, password-protected AppleTalk networks.

Software acquisition. Most managers contacted are moving toward simpler, cheaper methods of buying software, including the purchase of site licenses and multiproduct packages, such as Microsoft Office.

What future direction for Apple do they agree on? The "perfect" workstation would include built-in Ethernet, a floating-point math coprocessor and a powerful CPU—all at a reasonable price. □

Remote access key to Mac use for Texas

It may be a truism that nobody loves the tax collector, but at the office of the State Comptroller of Public Accounts in Austin, Texas, tax collectors love their Macs, all 900 of them.

"Macs are all over, and they do everything here," said Alice Alvarado, a systems analyst who provides support for the agency's computer users.

Although the main function of the Comptroller's office is collecting state, local and sales tax revenues, the department where Macs are most prevalent is research, Alvarado said. "Our research division does a lot of work with the state legislature on bills that come across concerning taxes and finance," she said, noting that Macs are used to crunch related numbers, such as population and income figures, to determine whether various plans and projects are workable.

Microsoft Word and Excel and Claris Corp.'s FileMaker Pro are the applications of choice across the board, Alvarado said. Presentation software is also gaining in popularity as workers are called on to explain complex findings to other agencies, government officials or the public. Her staff provides only minimal support for software, she said, delegating the task to a newly formed group of in-house Mac experts.

"The agency has begun a support program where they recruit SMEs, or Subject Matter Experts, from different departments," Alvarado said. "They actually give classes offering instruction, tips and tricks, and they are available by phone or in person for questions. We encourage employees to deal with them before calling the vendor."

AppleTalk Remote Access (ARA) has proved to be an invaluable tool for auditors in particular, Alvarado said, although many employees have taken advantage of it to work at home as well. "It's a real handy tool for auditors in the field to be able to call right in, get their mail messages, get data and actually print things out," she said. However, since auditors generally work in teams, ARA roadblocks are beginning to appear, prompting a look at multi-user telecommunications servers. "Instead of having one-to-one communication, we want to have several users accessing one machine. That will definitely save us some money," she said.

To the Mac's detriment, the state's networking standard is token ring, widely used to connect IBM PCs and mainframes but never a major Mac standard. "There are cards and such for the Mac," Alvarado said, but such add-ons become costly when multiplied by hundreds of users. Built-in token-ring support would be at the top of her wish list for future Mac models, she said. — By Mitzi Waltz

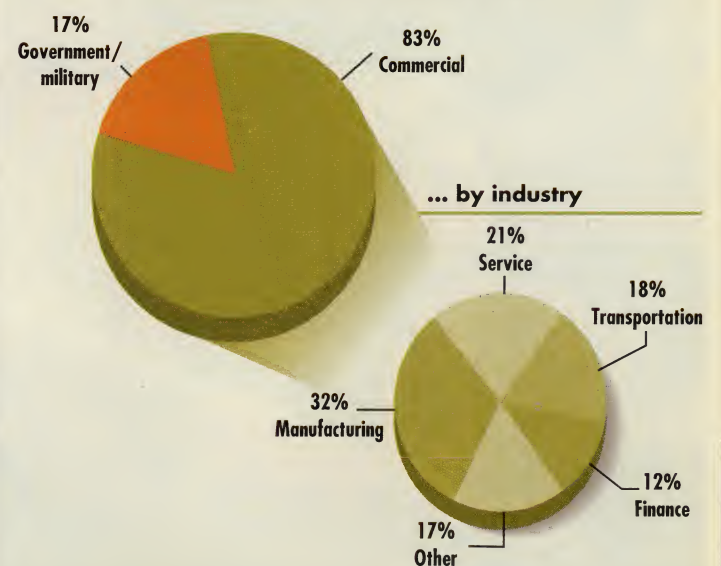


BILL ALBRECHT

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
151	Chevron Research Co.	Richmond, Calif.	809	100	N/A
152	Epsilon Data Management Inc.	Burlington, Mass.	809	100	30
153	General Dynamics Corp.	San Diego, Calif.	806	500	50
154	Arco Exploration & Production Technologies	Plano, Texas	800	1,200	300
155	GE Medical	New Berlin, Wis.	800	800	100
156	Raynet Corp.	Menlo Park, Calif.	800	30	70
157	Chevron Information Technology Co.	San Ramon, Calif.	800	4,900	24
158	Martin Marietta Information Systems*	Philadelphia, Pa.	800	3,000	N/A
159	The Aerospace Company	Los Angeles, Calif.	798	1,600	100
160	KPMG Peat Marwick*	New York, N.Y.	787	350	350
161	SUNY Health Center	Syracuse, N.Y.	776	800	45
162	Turner Broadcasting System Inc.	Atlanta, Ga.	775	1,300	50
163	Govt. Tactical Equipment, Mobile Subscriber Equipment Div.	Taunton, Mass.	773	500	45
164	Sprint, Research & Development*	Overland Park, Kan.	767	250	5
165	Stratus Computer Inc.	Marlborough, Mass.	760	300	600
166	Raytheon Co.*	Tewksbury, Mass.	756	1,500	15
167	Martin Marietta*	Camillus, N.Y.	750	1,000	600
168	Electronic Data Systems Corp.*	Schenectady, N.Y.	746	700	20
169	Ochsner Foundation Hospital	New Orleans, La.	746	1,000	2
170	Ontario Hydro	Toronto, Ontario	745	13,000	200
171	Rockwell International Corp., Space Systems Division	Downey, Calif.	744	3,000	50
172	Rohm and Haas Co. Delaware Valley Inc.	Bristol, Pa.	731	1,438	40
173	University of Utah Medical Center, Scientific Computing	Salt Lake City, Utah	730	750	150
174	Bristol-Myers Squibb Inc.	Princeton, N.J.	726	750	100
175	Northern Telecom Ltd.*	Ottawa, Ontario	726	N/A	N/A

*Locations with multiple sites. N/A = not available.

MacWEEK 200 by business



Base: All MacWEEK 200 sites.

Base: All MacWEEK 200 commercial sites.

Tech users say two computers are better

Macs share desktops with Unix machines at some MacWEEK 200 sites because Macs fill in where workstations fall short.

By Margie Wylie

A growing cadre of technical, scientific and engineering users is defying the conventional snobbery that says a really good computer has to be hard to use and is quietly adopting the Macintosh to use alongside high-powered Unix workstations.

At these MacWEEK 200 sites, scientific and engineering users rely on Unix workstations and highly specialized programs to crunch numbers, model complex processes, and draw engineering blueprints or topographical maps.

But when it comes to making their work understandable to their peers or their bosses — or simply performing the functions of day-to-day business — these techie types turn to the Macintosh in their cubes.

Macs make maps. At the U.S. Geological Survey's offices, No. 80 on the MacWEEK 200 list, about 200 cartographers, geologists, geophysicists and hydrologists rely on both a Macintosh and a Unix workstation to catalog and study the geological riches (and hazards) of the United States. (The site has 1,300 Macs and 1,500 workstations.) While some engineers at the site prefer an IBM PC or compatible in addition to a workstation, the majority use the Mac just because it's simpler, said Calae Runge, computer specialist for USGS. "Here in our agency [the Mac] has overcome its image as a toy."

But that doesn't mean technical users are likely to abandon their Unix workstations in favor of the Mac any time soon. Even with A/UX, Apple's version of Unix, Macs lack the raw processing power, the mammoth

storage capacity, and the slew of technical and scientific programs available to Unix workstations today.

So, while the Mac cannot run programs that simulate earthquakes or model the convection currents in a volcano, like USGS' Data General Unix workstations can, it fills in where workstations fall short: communications.

The Mac helps technical types share their work with each other and the outside world, a function vital to the research organization.

"I've seen many times when the geologists will take a portion of a map, usually a basin of oil, coal or other resources, created on their Unix workstations using a sophisticated interactive surface-modeling program, and scan or import the file into Adobe Illustrator [on the Mac]," Runge said. "Then they'll color it and add icons and notes or other effects."

USGS users also employ the Mac to publish reports; create slide shows; and perform mundane functions such as assembling electronic mail that is then, ironically, sent via a Unix-based E-mail service, Runge said.

USGS users also share PostScript printers between Macs and Unix workstations.

And some USGS users have even given up workstations entirely in favor of logging onto Unix servers through terminal emulators, such as Synergy Software's VersaTerm-PRO, or through X Window display server packages, Runge said.

Lockheed flies Mac. At Lockheed Missiles & Space Co. Inc. in Sunnyvale, Calif., No. 8 on the MacWEEK 200 list, the emphasis is a little more practical, but the choice is the same. Engineers with the aerospace government contractor choose Macs more often than PCs "by a substantial margin," said Mike Bailey, Lockheed systems analyst.

"The reason that they have to be in both worlds is that nobody else can communicate with the high-powered workstations," Bailey said. "When they have to be involved in a departmental E-mail system or turn in work that is presentable to others ... the Mac has

been the machine of choice here for years." Despite the Unix snobbery on the part of some technical users, "a lot of [engineers] really appreciate the fact that the Mac is easier to use."

But that's not all they like: While the Mac may seem a little pricey to PC users, it's a bargain in the Unix world. Just adding the disk space or buying the programs for layout, word processing and drawing can cost far more than an entire high-end Macintosh with a variety of programs, Bailey said.

Plus, Macs have more and better general applications available.

While some technical users like the Mac's capability to hook into the Unix world, engineers at Lockheed generally don't use their Macs to access Unix services. "Generally, users transfer the results of their work [from a Unix workstation] to a Macintosh for desktop publishing," Bailey said.

For example, an engineer might translate a drawing of a jet turbine from CGM (Computer Graphics Metafile) format into TIFF and import it into an Aldus PageMaker layout with text from a Macintosh word processing program, Bailey said.

"The two worlds just don't get along as far as transferring information back and forth very well," Bailey said.

OmniSwitch imagineers. Ed Mayhugh, president of OmniSwitch Inc., No. 21 on the list, disagreed.

Whether they design software and systems for the company's Video Library on-line video system or offer video-production services to OmniSwitch

clients, most of OmniSwitch's employees have both a Unix workstation and a Macintosh on their desktops, Mayhugh said. And that's a result, at least in part, of the Mac being "just so easy to network in the Unix environment with TCP/IP and ... the ability to port PostScript [files] from a Unix environment to the Macintosh, and vice versa," Mayhugh said. "So it became a very natural fit for the Mac and Unix to be used concurrently."

Still, the Mac and Unix fill two different roles for OmniSwitch's "imagineers," as Mayhugh calls his company's technical users.

While Unix offers the company sophisticated development tools for its on-line video products, he said, "there's this human communications function of taking very technical information, simplifying it and being able to communicate that, and of course, they use desktop publishing for that."

Mayhugh said the public-domain software; Apple products, such as MacTCP and A/UX; Network File System mounters from companies such as InterCon Systems Corp. of Herndon, Va.; and Unix-based AppleTalk servers from companies such as Helios USA of Cupertino, Calif., make integrating the Mac and Unix easy.

His imagineers, like most engineers, also see the technical merit of Apple's leading-edge development, Mayhugh said. "Almost five years ago Apple began building X.400 into its operating systems, when other companies didn't know what X.400 was," he

See Tech users, Page 54

When it comes to making their work understandable to their peers or their bosses — or simply performing the functions of day-to-day business — these techie types turn to the Mac in their cubes.

At the U.S. Geological Survey, computer specialist Calae Runge and physical scientist Mike Crane often take portions of maps created on Unix machines and bring them into the Mac for refinements.



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The HP ScanJet IIc sets a new standard for affordable color scanners. Its engine is fast and well-engineered, and HP's innovative color-calibration software makes hassle-free, "true"-color scans a reality. Prices at less than \$2,000, the HP ScanJet IIc is a best buy in its class.

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The HP ScanJet IIc uses a one-pass scanning method that makes it one of the fastest color scanners we've seen. It also provides time-saving color previews that dynamically display any changes you make to the scan, such as exposure, hue, and saturation modification.

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Speed. Simplicity. And accuracy were all applauded. It's no wonder. HP's single-pass scanning delivers both lightning-fast speed and precise color registration. TWAIN support allows scanning without having to switch between applications. And HP AccuPage technology with 400-dpi resolution can tackle the toughest OCR challenges. What's more, capabilities this advanced have never been this affordable. List price on the HP ScanJet IIc is just

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HP ScanJet IIc



HP ScanJet IIp



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Medical professionals rely on Mac graphics for research

Some very sophisticated Mac applications used at medical institutions are pushing the envelope of DNA research.

By Cliff Lehman

High-tech equipment is no stranger to the medical community. And the 1993 MacWEEK 200 shows that the Mac is taking its place among the electron microscopes, CAT scanners and magnetic-resonance imagers at research hospitals, pharmaceutical companies and other medical institutions. These companies use specialized Mac applications that set them apart from other industries on the list.

Needles in a DNA haystack. At the National Institutes of Health, No. 22 on the MacWEEK 200 list, scientists conducting genetic research use sequence-analysis tools on Macs to unravel the structures of DNA (deoxyribonucleic acid), said Dale Graham, a scientific consultant at the institute.

DNA consists of sequences of adenosine, cytosine, guanosine and thymidine mole-

cules, which even Ph.D.s refer to as A, C, G and T. Researchers attempt to identify these sequences, separate them from neighboring ones and eventually discover their functions. "Scientists are looking for specific sites [in DNA strands] where the same information is repeated at certain distances," Graham said.

Normal DNA lab work involves painstaking use of special enzymes to "cut" a sequence out of its original strand, and other enzymes to "paste" it into a different DNA strand, which scientists then replicate to study the displaced sequence. Gene Construction Kit from Textco Inc. of West Lebanon, N.H., lets scientists practice such experiments electronically before trying them in the lab.

"You can lay out your whole strategy for a cloning project and then see it make adjustments," said Bob Gross, president of Textco. "And you can do it in an afternoon or day at the computer instead of spending months and thousands of dol-

lars in the lab before finding a mistake."

Another program used at NIH for work with DNA is HelixScan from General Atomics of San Diego; like Gene Construction Kit, the program is unique to the Mac. HelixScan takes scans of gels that contain strands of DNA, interprets the ACGT order and generates a text file. This text can be exported into Gene Construction Kit or sequence-analysis tools, such as MacVector from Eastman Laboratory and Research Products of New Haven, Conn., and GeneWorks from IntelliGenetics Inc. of Mountain View, Calif.

The interface works. According to Graham and others, medical researchers favor the Mac because of its interface.

"Researchers don't want to spend any more time learning the operating system than necessary," Graham said. "They want to get in and get out. For them the Mac is great, and many are just finding out how effective these tools can be."

At Rhode Island Hospital, No. 15 on the list, John Pezzullo, director of the Information Technology Center, echoes that assessment: "Most research and data analysis is done on Macs here. To some extent it has to do with the left-brain, right-brain divide, and researchers are more intuitive.

"Researchers who use PCs usually do so because the particular software they want is not available on the Mac," he said.

The analysts at pharmaceutical companies may be on the right-brain side of that divide

See Medical, Page 54



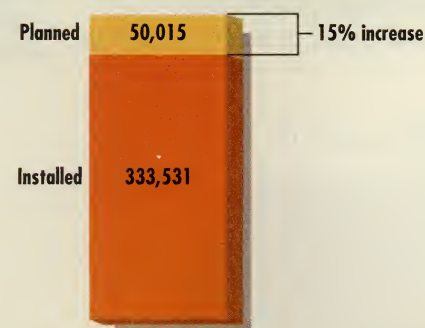
ROB CRANDALL

Dale Graham, a scientific consultant at the National Institutes of Health, says scientists there are using Macs and specialized software to "unravel the structures of DNA."

Rank	Company	Location	Total Macs	Non-Mac PCs	Workstations
176	Martin Marietta*	Falcon AFB, Colo.	724	132	551
177	Montgomery Securities	San Francisco, Calif.	719	60	5
178	Pfizer Inc.	Groton, Conn.	717	225	20
179	Visa International	San Mateo, Calif.	715	1,000	10
180	Space Systems/Loral	Palo Alto, Calif.	708	1,200	80
181	NASA Ames Dryden Research Facility	Edwards, Calif.	705	100	40
182	KPMG Peat Marwick*	Los Angeles, Calif.	704	300	N/A
183	WGBH Educational Foundation	Boston, Mass.	701	35	2
184	Allergan Inc.	Irvine, Calif.	700	800	35
185	Veterans Administration Medical Center	Palo Alto, Calif.	700	400	40
186	I-NET Inc.	Houston, Texas	700	50	50
187	Pacific Bell Directory	San Francisco, Calif.	700	850	0
188	BankAmerica Corp.	San Francisco, Calif.	700	N/A	N/A
189	U.S. Department of Defense	China Lake, Calif.	696	200	50
190	KPMG Peat Marwick*	Chicago, Ill.	676	400	30
191	Energy, Mines and Resource Bureau of Canada	Ottawa, Ontario	675	2,800	30
192	Dana-Farber Cancer Institute	Boston, Mass.	675	1,100	60
193	BP America	Cleveland, Ohio	672	1,600	N/A
194	Engineering Resources Inc.	Sussex, N.J.	654	1,500	2,000
195	General Atomics	San Diego, Calif.	653	800	30
196	Chapman & Cutler	Chicago, Ill.	651	4	10
197	Lockheed Missiles & Space Co. Inc., R&D Lab*	Palo Alto, Calif.	650	500	275
198	David Sarnoff Research Center Inc.	Princeton, N.J.	649	100	200
199	Canadian Imperial Bank of Commerce	Toronto, Ontario	640	20,000	60
200	Southern California Edison Co.	Covina, Calif.	640	500	25

*Locations with multiple sites. N/A = not available.

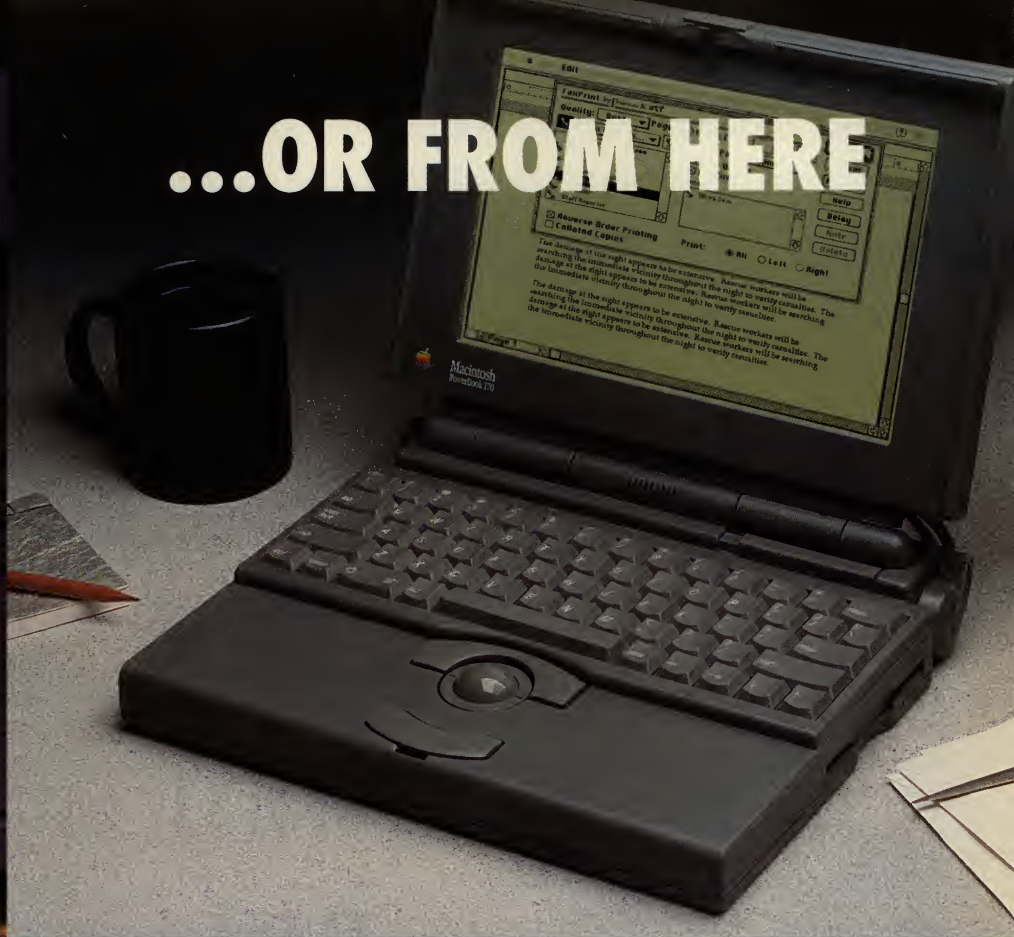
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Base: Total number of Macintoshes installed or planned for purchase.

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COMstation THREE	—	14.4	N/A
COMstation FOUR	PowerModem III	9600	9600
COMstation FIVE	PowerModem IV	14.4	14.4

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Tech users

From Page 50

said. "There's always been this tendency to build Toolbox functions that enhance human communications."

Combo computers. Despite his love affair with the Macintosh, Lockheed's Bailey looks forward to a day when his engineers can run a vertical engineering, statistics or modeling package on the same computer

as their favorite Macintosh applications. "When things like PowerPC come out, we're going to see that sort of thing happen," Bailey said. Then engineers will be able to run more than one operating system on one machine.

Until then, Unix-dependent users said they'll just have to make do with two different environments that can be brought partially together through A/UX file transfer and AppleTalk and TCP/IP networking tools. □

Medical

From Page 52

— they spend much of their time studying the molecular structures of chemicals that go into drugs — but they've got their own set of tools and reasons for using the Mac. Chief among these is the selection of chemical drawing packages on the Macintosh.

IsisDraw from Molecular Designs Ltd. of San Leandro, Calif., and ChemDraw from Cambridge Scientific Computing Inc. of

Cambridge, Mass., for instance, are popular at SmithKline Beecham Clinical Laboratories, No. 144 on the MacWEEK 200 list. One SmithKline specialist in chemical drawing, who declined to be named, said IsisDraw is attracting users because its drawings retain their underlying chemical information even after being pasted in and out of word processing documents and because it is available for IBM PCs and compatibles as well.

An IsisDraw molecule "is not just a picture," said the specialist. "If you try to add too many bonds to a molecule, you can exceed its valence, and [the program] will warn you and allow you to accept or cancel."

Medical multimedia. Unlike chemical analysis, which has already made its mark in this community, multimedia is mostly a bundle of possibilities in medical training, client education and consultations among multiple doctors.

CAT (computerized axial tomography) scanners, magnetic-resonance imagers, nuclear medicine scans, electron microscopes and gamma-knife devices all produce data in the form of images. And packages such as MedVision from Evergreen Technologies Inc. of Gaithersburg, Md., and Spectral Engine from 4pi Analysis Inc. of Durham, N.C., are aimed at analyzing these data.

Like everyone else, doctors need to present their work. So besides the clinical and research uses, these programs serve as a bridge bringing medical images into the Mac for multimedia presentations.

At the University of Texas, MD Anderson Cancer Center, No. 33 on the list, John Grossman, project director for imaging and software, oversees several multimedia projects. "The idea," Grossman said, "is to have a general-purpose medical-image database to develop and publish educational materials and to support remote consultation as well as multidisciplinary conferences for patient management."

Some of these multidisciplinary conferences, at which information on several patients is presented to committees of doctors from different specialties, make use of Mac-based patient information.

"We gather images from pathology and radiology as well as text files and put them on the file server to be available to conferences or individual users across the network," Grossman said. An education project at the Cancer Center also has produced the Images in Medicine CD-ROM, which contains pictures from the center's Radiologic Pathologic Institute.

Life Scan Inc., a manufacturer of blood-glucose monitors and No. 142 on the list, is using medical multimedia for in-house training and customer service. "We're upgrading our backbone to fiber running FDDI (Fiber Distributed Data Interface) to allow for graphic images and even some QuickTime movies to be transmitted over the network," said Tim Bateman, Life Scan microcomputer analyst.

Although the medical institutions and research sites face many of the same computing problems as the rest of the corporate community, the nature of their R&D work has produced a wealth of specialized Mac-based tools. As these tools have become widespread at places such as the Cleveland Clinic Foundation, the medical industry has emerged as a distinct group within the MacWEEK 200. □

Cursor control. After all, that's what a pointing device really is all about. And now, with the introduction of Turbo Mouse® 4.0, cursor control takes on a whole new meaning.

Macworld said, "Turbo Mouse 4.0 represents a real breakthrough in trackball software design. If you're shopping for a trackball, Turbo Mouse deserves first consideration."

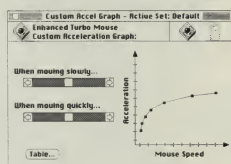
Why a breakthrough? Why is Turbo Mouse rated number 1?

The answer lies in a new and total integration of hardware and software. Take a look:

Custom Acceleration lets you change cursor speed according to the way you move the trackball. The faster the movement, the faster the acceleration. You can even have negative acceleration for detailed and precise work.

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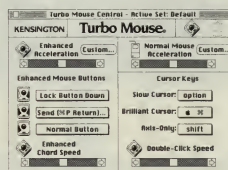


another. A real plus for large screen and multiple monitor setups.

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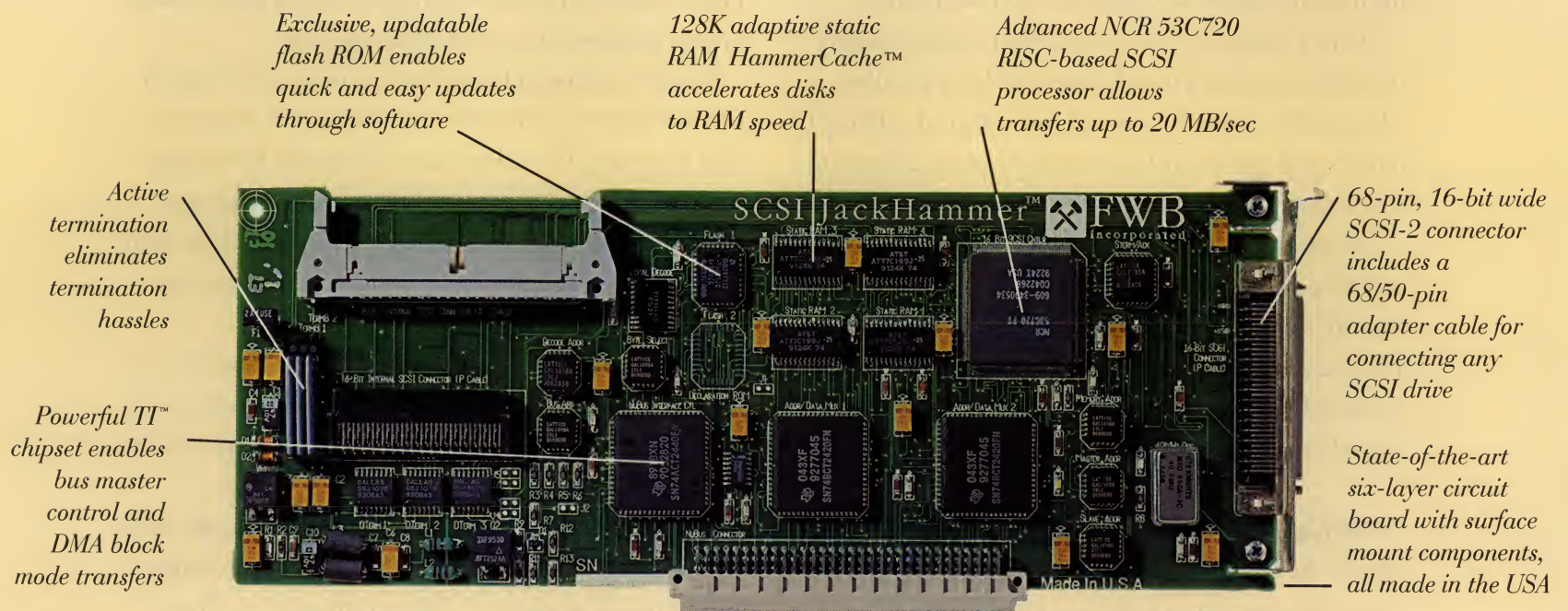
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Education 50's hardware base diverse

The Education 50, the 50 U.S. and Canadian education sites with the largest number of Macs, have slightly more low-end models installed than their corporate and government counterparts, but the colleges' and universities' purchase plans show that they too are moving toward 68040-based machines and PowerBooks.

All the Education 50 sites have Mac II-family models installed, accounting for 47 percent of Macs installed. Almost half of these (22 percent) are either Mac IIfx or IIsi models, and other Mac II models account for 25 percent. Machines from the Mac LC series account for 10 percent.

Compact models are also popular on campus. Almost all sites (98 percent) have either a Classic, including the Classic II, or an SE installed; the Classics and SEs together account for 15 percent of all Mac models. With SE/30s comprising an additional 8 percent of installed Macs, an average of 23 percent of the Macs at the Education 50 sites are compact models.

The high end for higher ed? Although every Education 50 site has at least one Quadra or Centris installed, these '040-based Macs make up a mere 3 percent of the

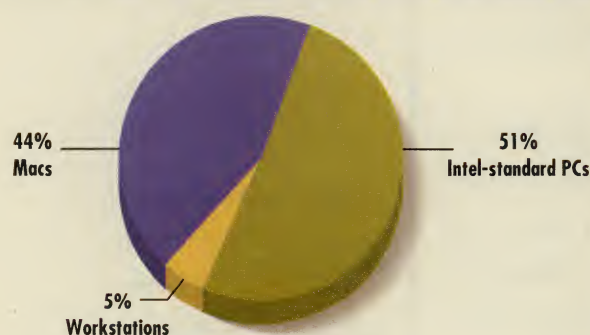
total installed base. When making purchase plans, however, these 50 sites show a clear shift toward the '040-based models. According to the survey, 70 percent of the sites plan to buy Quadras, and almost as many (66 percent) plan to buy Centris 610 or 650 machines. Together these higher-powered desktop computers account for one-third of Mac purchases planned for the next year.

Similarly, although PowerBooks now represent only 6 percent of the installed base (even though 98 percent of sites have some PowerBooks and 84 percent have Duos), notebook Macs will be increasingly popular on campus. They account for 20 percent of planned acquisitions, with Duos at 4 percent and other PowerBooks at 16 percent.

Other computers. Intel-standard microcomputers are found at virtually all (98 percent) Education 50 sites, with an average of 4,090 per site. These sites also report an average of 433 workstations.

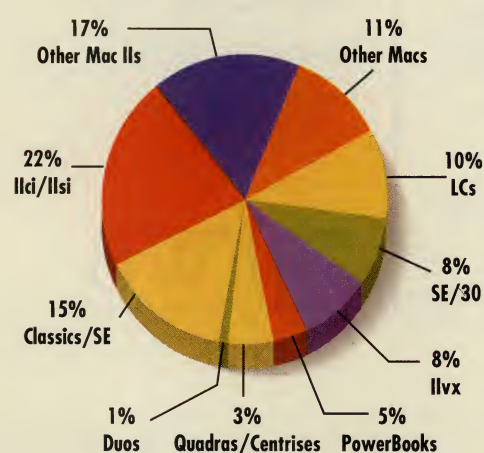
In all, the Education 50 sites have more than 400,000 Macs, Intel-standard microcomputers or workstations on campus. Almost half (44 percent) of all these computers are Macs. □

Microcomputer and workstation breakdown



Base: Total number of personal computers and workstations installed.

Breakdown of Mac models installed



Base: Total number of Macintoshes installed.

Rank	University	Location	Total Macs	Non-Mac PCs	Workstations
1	University of Michigan	Ann Arbor, Mich.	12,000	9,500	2,000
2	University of British Columbia	Vancouver, British Columbia	10,024	N/A	N/A
3	University of California	Berkeley, Calif.	10,000	10,000	500
4	University of Minnesota	Minneapolis, Minn.	8,895	7,000	600
5	University of Illinois	Champaign, Ill.	6,121	12,391	150
6	University of Alberta	Edmonton, Alberta	5,848	7,000	1,500
7	University of California	San Francisco, Calif.	5,750	4,000	100
8	University of Utah	Salt Lake City, Utah	5,475	5,000	550
9	Stanford University	Stanford, Calif.	5,000	5,000	1,500
10	University of Pennsylvania	Philadelphia, Pa.	5,000	5,000	500
11	University of Rochester	Rochester, N.Y.	4,970	9,000	200
12	University of Toronto	Toronto, Ontario	4,700	7,000	500
13	University of Chicago	Chicago, Ill.	4,508	2,300	700
14	Washington University	St. Louis, Mo.	4,464	10,000	N/A
15	University of Iowa	Iowa City, Iowa	4,420	4,300	600
16	University of California	Davis, Calif.	4,147	9,977	230
17	Columbia University	New York, N.Y.	4,050	7,500	500
18	Ohio State University	Columbus, Ohio	3,746	4,261	N/A
19	Pennsylvania State University	State College, Pa.	3,500	3,000	175
20	University of Calgary	Calgary, Alberta	3,326	325	N/A
21	Maricopa Community Colleges	Tempe, Ariz.	3,202	1,731	20
22	Florida State University	Tallahassee, Fla.	3,150	1,900	100
23	Yale University	New Haven, Conn.	3,077	4,200	550
24	University of Alabama	Tuscaloosa, Ala.	3,048	10,000	30
25	University of California	Los Angeles, Calif.	3,000	10,000	1,000

N/A = not available.

Macs receive top grades at large education sites

The top five universities own more than 47,000 Macs, and the PowerBooks have become a scholarly status symbol. But tight budgets are squeezing support and services.

By Mitzi Waltz

What do the University of Michigan at Ann Arbor, the University of British Columbia in Vancouver, the University of California at Berkeley, the University of Minnesota at Minneapolis and the University of Illinois at Urbana-Champaign have in common? Along with reputations for academic excellence, they have more Macs than any other educational sites in North America. Altogether, these five have 47,040.

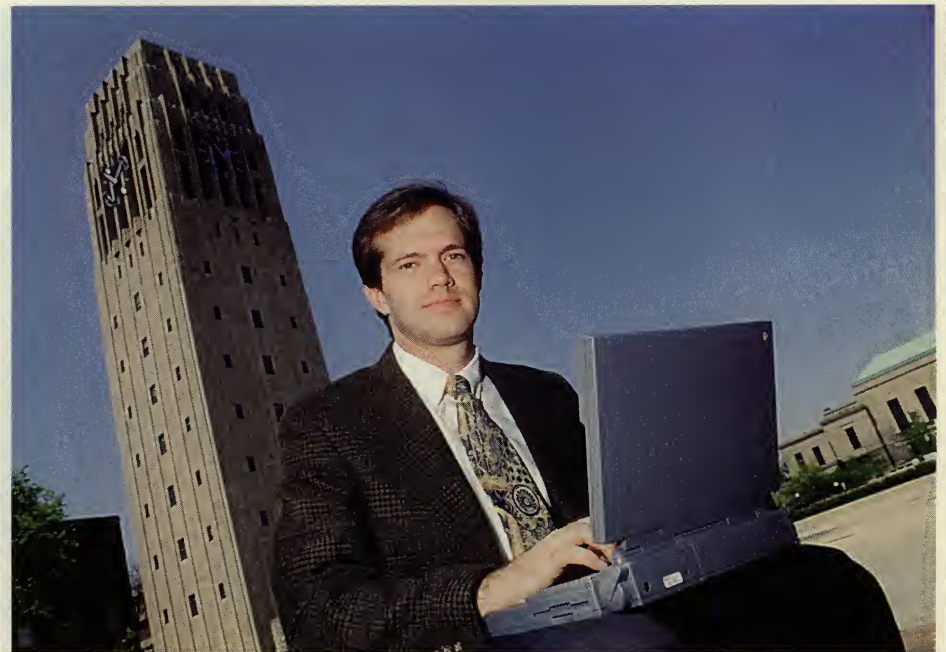
They also share a number of common concerns: making way for portables, networking, security, as well as this year's top concern, equipment cost.

Tight budgets. Computer companies looking for buyers may not find wide-open doors at many college campuses if the situation at these sites is typical. Overall funding is down at many schools, new machine pur-

chases are getting harder to justify, and even equipment already on-site faces problems as support centers close up or limit their services to complex central mainframes.

At the University of British Columbia, support funding for desktop machines has been discontinued, throwing that chore to departmental Mac mavens, said Darren Craze, manager of the university's customer support center. "Departments can contract with us for support, but typically they do it themselves now," he said.

Mac users have fared better than others under this austerity plan, Craze noted. "In general, Macs are probably easier to support than PCs, for the same reasons Apple uses to



"What we would really like to see is a low-end PowerBook," said Andrew Palms, manager of campus computing at the University of Michigan, No. 1 on the Education 50 list.

try to get you to buy its machines," he said. "It's the consistency from application to application. That's especially important in a university environment, where users will grab a lot of shareware and public-domain stuff."

Not all Mac news is bad. While spending cuts have affected computer purchases across the board, Craze said, they haven't slowed the Mac's spread on campus. Only the engineering department has shied away, he said, preferring high-powered workstations instead.

At the University of Minnesota, the Mac has also found its way into most departments, according to Mary Kelleher, editor in the university's computer and information services department. "The models keep changing so fast" that no one desktop Mac has outstripped the rest in popularity, she said, but PowerBooks seem to be on everyone's wish lists. "The growth is definitely in portable machines," Kelleher said, adding that most PowerBooks are purchased to supplement, not replace, desktop systems.

Portability takes precedence. "What we would really like to see is a low-end PowerBook," said Andrew Palms, manager of campus computing sites at the University of

See Education, next page

Rank	University	Location	Total Macs	Non-Mac PCs	Workstations
26	Arizona State University	Tempe, Ariz.	3,000	5,000	1,000
27	University of Maryland	College Park, Md.	2,902	3,500	1,500
28	Stephen F. Austin State University	Nacogdoches, Texas	2,900	1,250	35
29	University of Illinois	Chicago, Ill.	2,890	4,000	200
30	State University of New York	Buffalo, N.Y.	2,720	2,800	300
31	Iowa State University	Ames, Iowa	2,600	3,500	850
32	University of Houston	Houston, Texas	2,585	3,500	200
33	Boston College	Chestnut Hill, Mass.	2,555	450	50
34	Franklin & Marshall College	Lancaster, Pa.	2,552	15	1
35	Drexel University	Philadelphia, Pa.	2,545	150	100
36	University of Missouri	Columbia, Mo.	2,500	3,500	400
37	University of Colorado	Boulder, Colo.	2,483	4,475	437
38	Bowling Green State University	Bowling Green, Ohio	2,482	1,475	50
39	University of Texas	San Antonio, Texas	2,390	1,500	200
40	Emory University	Atlanta, Ga.	2,382	1,500	100
41	Simon Fraser University	Burnaby, British Columbia	2,224	800	500
42	Rice University	Houston, Texas	2,095	75	600
43	University of Arizona	Tucson, Ariz.	2,050	10,000	400
44	Rochester Institute of Technology	Rochester, N.Y.	2,000	1,700	300
45	University of Tennessee	Memphis, Tenn.	2,000	400	30
46	University of Notre Dame	Notre Dame, Ind.	1,882	1,200	340
47	University of Arkansas	Fayetteville, Ark.	1,868	550	39
48	Brown University	Providence, R.I.	1,850	1,500	300
49	University of Massachusetts	Amherst, Mass.	1,815	3,000	500
50	University of Massachusetts	Lowell, Mass.	1,767	800	500

Sites with various Mac models installed

	Average number	Percentage of sites
Quadras/Centrises	126	100%
Classics/SE	562	98%
LCs	351	98%
PowerBooks	168	98%
IIx/IIx+	807	96%
SE/30	318	92%
Other Mac IIs	675	90%
Other Macs	443	88%
IIvx	335	86%
Duos	30	84%

Base: All Education 50 sites.

Seth Novogrodsky, a programmer with U.C. Berkeley's Workstation Support Services team, says educating users has been effective against security problems.



JAMIE TANAKA

Education

From previous page

Michigan. "That would definitely sell on campus. We'd like to see one with an internal Ethernet adapter so people could go around campus and hook into a high-speed network whenever they need to."

That sentiment is shared at all of the top-five universities. At the University of Illinois, for example, the Mac PowerBook is replacing the letter sweater and the scientific calculator as a scholarly status symbol, according to Richard Wilson, associate chancellor.

"The Macintosh is used in almost every department on campus by students, departments and faculty, and for both personal and

departmental use," said Wilson, who supervises departmental and student sales through the central campus store. "The Mac II line is the machine we've sold the most of, but recently the PowerBook line has become very popular. A lot of people want to have a machine that they can take with them, either to work at home or take with them as they travel."

Wilson said quite a few PowerBook users carry their high-prestige machines around constantly, opening their cases in classrooms, offices or the library for note taking and even tapping the keys in the student-union lounge. "They're using them for day-to-day routine business," such as keeping track of schedules and writing memos, he said.

Portable machines of all sorts have proved to be so useful that the university is now considering ways to incorporate them into the classroom, Wilson said. "What we're looking at now is pen-based systems, tablets that we could use as part of instructional programs and that students could carry with them to classes." Although the Newton's development is certainly being watched with interest, Apple has no special edge over other potential pen-top makers, he said.

These new machines would function as an extension of the old student notebook, he said, allowing for note taking, mathematical calculations and scheduling on the fly. "These devices need to be advanced in their recognition of handwriting and usable with regular software packages and peripheral devices," he said. "We have a committee that is looking at what's available."

Networking needs. Unfortunately, the desire for greater network access has outstripped most universities' ability to pay for running wires and supporting users. "Increasingly, departments are connected to the campus network — our central networking people certainly want to get everyone hooked up — but everything on campus is based on decentralized funding," said British Columbia's Craze. "Departments have to decide if that's where they want their money spent." A question that each administrative unit must decide for itself is whether to spend money on linking up with mainframes, the Internet or other outside resources rather than on extra teaching assistants or research materials.

That makes arranging for certain resources,

Sites planning to buy various models

	Average number	Percentage of sites
Quadrax	70	70%
Centrises	195	66%
PowerBooks*	97	62%
LC II or III	212	60%
Duo 210/230	36	58%
Any Classic	111	56%
Color PowerBooks	38	56%
Ilci/Ilvx/Ilisi	67	46%
Other Macs	72	12%

Base: All Education 50 sites. *Excluding Duos and color models.

such as multi-user AppleTalk Remote Access (ARA) services, central printing services and campuswide electronic mail, difficult. At Minnesota, Kelleher said, Internet access is something everyone wants but only some can afford. Last fall the university provided its full-time staff members with Internet addresses through a central E-mail system. Not all departments are linked with the network, however — many had set up LANs independently, with a resulting chaos of standards.

Quite a few PowerBook

users carry their machines

around constantly, opening

their cases in classrooms,

offices or the library.

Minnesota does offer Serial Line Internet Protocol-based dial-up access to mainframes and other systemwide resources, and many departments are taking advantage of it, Kelleher said.

Widening the net. Access to central computing services has always been in high demand at the University of California at Berkeley, but that demand is reaching a fever pitch as computers spread from the hands of computer-science majors and engineering students to the entire student body at this prestigious and academically challenging university.

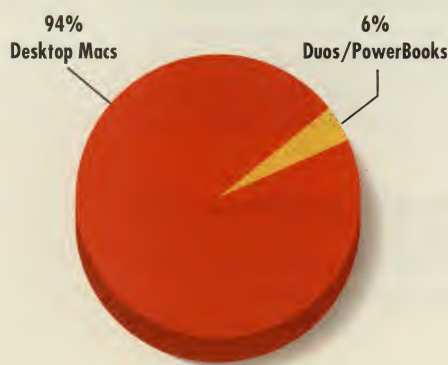
U.C. Berkeley is doing its best to respond to students' needs. "We're trying to get all of the dorms networked," said April Roy, manager of the university's department of information sciences and technology. "Several are already on-line at this time. Our goal is to get a computer into every student's hands."

Those dorms that have been linked with the campuswide network feature in-house computing labs, where students can gather to work on assignments after classes. Many students also have their own machines in their dorm rooms, of course, but there is no plan to offer networking services to individuals.

"Access to network resources is becoming

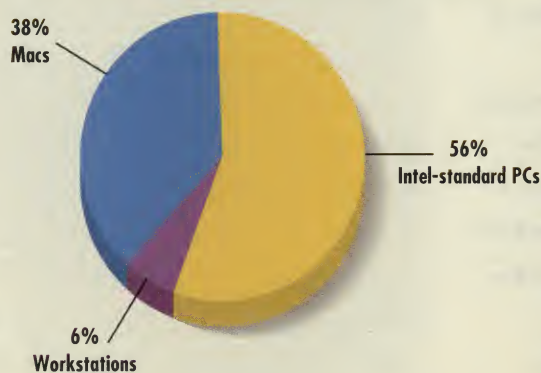
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Desktop Macs vs. Duos and PowerBooks



Base: Total number of Macintoshes installed.

Breakdown of 12-month purchase plans by platform



Base: Total number of microcomputers and workstations planned for purchase.



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Classics big at Bowling Green

With a history of Mac purchases that dates back to 1985, Bowling Green State University of Ohio, No. 38 on the Education 50, has a good handle on using Macs to further education. To support its 16,000 students, the university owns about 2,500 Macs, located in computer labs, administrative offices, instructors' offices and residence halls.

In the past year, Bowling Green State has bought some 2,000 Mac Classics. According to Dick Conrad, computer services director, older Macs are phased out regularly as new ones take their place.

"We've been buying Macs since they came out, and we rotate things around a lot," he said. "You'll see all newer systems in our labs now — nothing more than 2 years old. When we take older Macs out of a lab, we put them in a rental pool and rent them out to students or professors for \$100 or \$200 per semester. When a system gets so old that nobody will rent it, we sell it for \$100 or so."

For years, the university's policy has been to buy bottom-end Macs because the main application on campus is word processing. "A lot of the Macs are used for general word processing and introductory classes," said Conrad, "and the Classics fit that role well."

Even for applications in department offices, Classics are the low-price choice. "A lot of departments don't have a lot of money," he said, "and when you're talking about sociology, history and English, a lot of the uses are basic word processing and spreadsheets rather than scientific use, where they need more power."

When an application warrants it, however, the university

goes to higher-level machines. In fact, it is setting up a scientific computing lab populated with about 40 Centris 650 systems.

Most Macs on campus are linked via AppleTalk networks on a TCP/IP backbone with LaserWriters and ImageWriters in various buildings. "In one residence hall that houses about 340 students, there are Macs in nearly every room, and all of them are networked to printers in the basement," Conrad said.

Formerly standardized on MacWrite 5.0 for word processing in its computer labs, the university switched to Microsoft Works when Claris Corp. upgraded MacWrite and increased the price.

The computer information services department provides free training and support for these programs.

Administrative users also run Eudora, a freeware electronic-mail package from the University of Illinois, and communicate with the university's mainframe accounting and record-keeping systems from their Macs via MacTCP. Individual departments and other users purchase software for spreadsheets and other uses as needed.

Thinking back over the university's history of Mac use, Conrad is fairly pleased. "When microcomputers first came out, we were heavily in the IBM camp," he said. "In 1985, our advisory committee recommended Macs as the basic word processing system, and we've been buying mostly Macs since then. It's only in the past year with prices dropping on 486 machines that we've been buying IBM again."

Still, probably four out of every five computers we've bought over the last three to five years have been Macintoshes." — By Charles Rubin



GARY SIGMAN/BLACK STAR

Richard Wilson, associate chancellor at the University of Illinois, says the Mac is used in almost every department on campus by students, faculty and administration.

computing strategy. Mac-related courses are offered for credit, and faculty members can join ongoing application-oriented courses, for which the university contracts with an outside vendor. Networking and remote-access classes are also occasionally available through the Workstation Support Services office, Novogrodsky added.

Remote access always offers opportunities for the clever hacker, Novogrodsky said, but measures are in place to protect U.C. Berkeley's network from intruders. "A number of departments have ARA servers, and users have to be authorized. For the general campus dial-up services, you have to have password access," he said. Sensitive administrative applications, such as computerized transcripts and personnel records, are kept mostly on IBM mainframes using the MVS operating system, a setup that offers extra protection.

Dial-in access to the university's mainframes and servers is overseen by a support team that manages the modems and software.

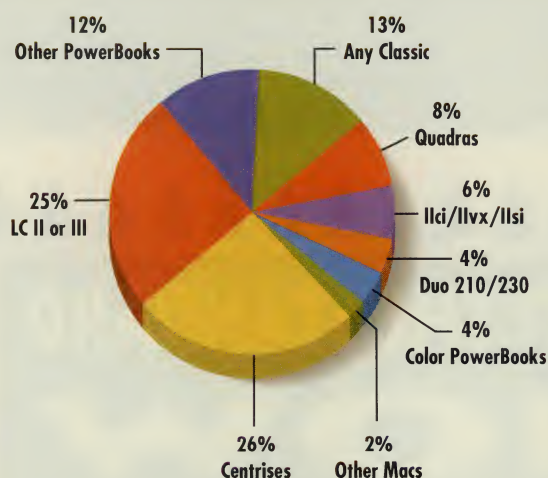
Positive changes. Decentralization seems to be here to stay, said Michigan's Palms, but with improved networking, departments won't risk losing touch with each other.

His university's long-term plan is to link all departments over a common Ethernet backbone, regardless of platform. "I think we'll see another 10,000 workstations networked within a year," he said. "That will mean almost everyone is hooked up."

As far as the money goes, Palms added, the trend has some benefits for end users. "We're seeing that the central organization is more effective at providing common services and infrastructure, like networking," he said. "Departments are best at knowing their own faculty's needs."

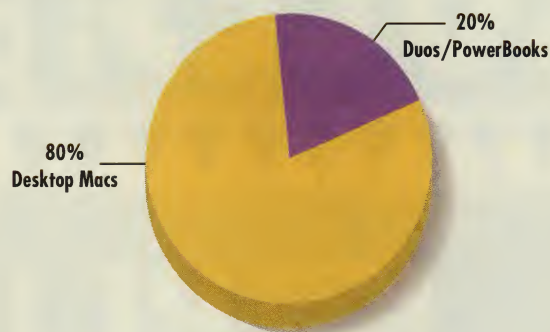
His department is concentrating less on enforcing standards and more on making sure the systems chosen can work together, Palms said. "Common authentication is important, as are common server packages and ways for mail packages to communicate with each other." Beyond that, end users have much more freedom to choose the hardware and software that best meets their needs — and their dwindling budgets. □

Breakdown of 12-month purchase plans by Mac model



Base: Total number of Macintoshes planned for purchase.

12-month purchase plans for desktop Macs vs. Duos and PowerBooks



Base: Total number of Macintoshes planned for purchase.

Education

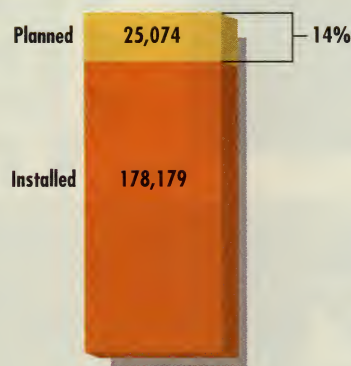
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more important, not less" in this age of powerful desktop machines, Roy said. "Students now need access not just to the mainframes but to the servers that we have available as well."

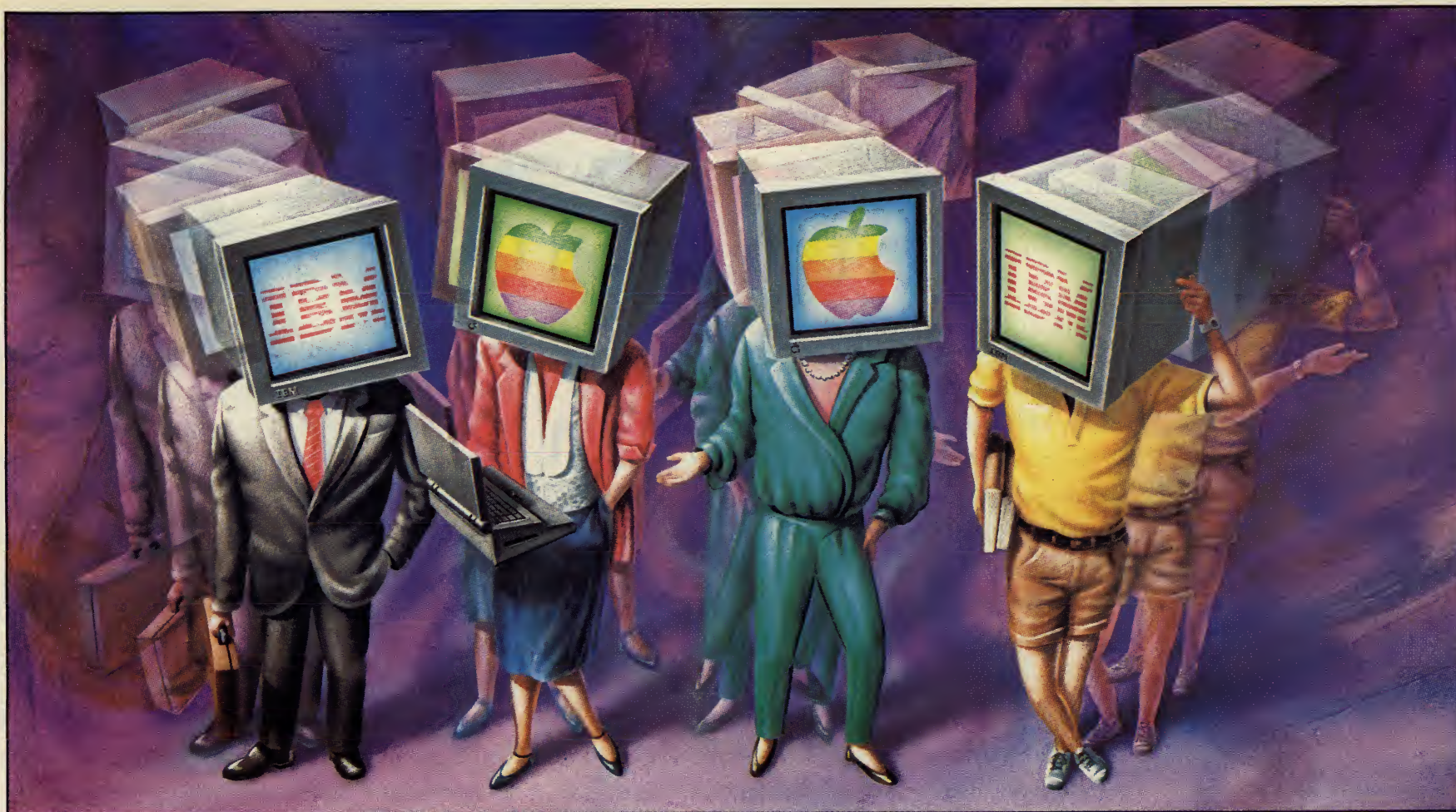
Security rules. Access to resources is a great thing, but college campuses are well-known breeding grounds for security problems — mix youthful exuberance with brains, and the result can be chaotic. However, U.C. Berkeley has had few Mac-related security problems, according to Seth Novogrodsky, a programmer, analyst and consultant with its Workstation Support Services team. "There were some problems a year ago, when people using System 7 weren't aware that the defaults in file sharing could make their [information vulnerable]," he said, but security staffers worked quickly to educate users.

Educating both students and faculty is an important part of the university's overall

Effect of 12-month purchase plans on installed base



Base: Total number of Macintoshes installed or planned for purchase.



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EDITORIAL

Don't abandon Quadra owners

Is Apple leaving its high-end customers high and dry? This month's Apple Worldwide Developers Conference produced disturbing indications that the company may not be planning to offer an Apple-brand upgrade path to owners of its original 68040-based Macs, the Quadra 700, 900 and 950. All three models were conspicuously missing from the list of systems for which Apple committed to delivering PowerPC upgrades; for the 25-MHz 700, Apple has not even offered an upgrade to 33 MHz.

Even more galling is an apparent decision not to make SCSI Manager 4.3 available to Quadra owners.

That just-completed upgrade, originally announced in 1989, brings significant and long-overdue improvements to the system software that manages disk I/O: It adds support for asynchronous operations and SCSI disconnect/reconnect so several devices can retrieve data in parallel, and activities such as tape backup can proceed without slowing the Mac to a jerky crawl; it enables users of dual-bus machines, such as the Quadra 900 and 950, to take full

advantage of their hardware; and it introduces a layered software architecture designed as a foundation for additional enhancements in the future.

Although the new SCSI Manager does not run on most current Macs, it does work, by way of a system extension, on the Quadras. That extension is on a CD-ROM Apple released to developers this month.

But according to the accompanying read-me file, SCSI Manager 4.3 "is currently not planned to be part of system software for Quadras or other released '040-based CPUs." Apparently the update will be offered only with future Mac models, starting with the upcoming Cyclone and Tempest.

On the whole, Apple has a commendable record for offering hardware upgrades and software enhancements to its installed base. To abandon that approach in the case of the Quadras is to deliver a slap in the face to some of the company's most important customers — those who have been willing to invest in its most advanced (and expensive) technologies. □

Commentary

Blockbuster idea might work for computer industry

Blockbuster Entertainment Corp., a national chain of video rental stores, recently went a long way toward demonstrating just how high-speed networking will change our lives. In collaboration with IBM Corp., it will deploy "custom CD printing while you wait" systems in its stores.

You go to the store, pick an existing record or mix and match tunes, and in six minutes your very own custom CD is baked and the color liner notes printed.

Suddenly, inventory problems vanish. No more struggling with the whims of fashion. The customers always get the record they want, whether an obscure Art Florissants opus or a hot Willie Nelson IRS special.

A CD proposal. Now, if we can do this for what the music industry calls software, what about distributing programs for personal computers via the same channel?

We'll call it Blockbuster Software. The economics are even better — smaller-size software for a higher price. Actually, the

problem might lie with the liner notes, a lot heavier in our business, unless we are willing to live with electronic documentation.

Today there is no guarantee that you can translate the enthusiasm arising from a good review or an interesting ad into a purchase. There is too much software changing too often and costing too much for the existing channels to cover.

An infrastructure such as the one proposed for music CDs by Blockbuster could very well remove these limitations for software developers. As soon as the program is on the store's server, anyone can get a copy on floppy or CD-ROM.

While marketing muscle would still have its role, it couldn't be used to crowd out the smaller authors and publishers.

Look at it as a derivative of shareware: Instead of downloading software from your favorite service, you go to a store with a faster network you can't afford at home.

Reality sets in. It's not clear what exactly will happen and when. Indeed, most major music publishers quickly announced their opposition to the Blockbuster proposal. Only Philips Consumer Electronics Co., a Blockbuster shareholder, is somewhat supportive of the idea. Companies have tried this idea before, with limited success. The presence of IBM and Blockbuster might improve the

concept's success, however.

Music publishers might not be ready to let customers pick individual segments on a recording. And they may have yet to evaluate the effect of

on-demand, on-site reproduction on their business. Large publishers such as Warner Bros. Inc. might reason that if the network is feasible for Blockbuster, they might as well get in the business themselves and retain more control.

In the personal computer software business, similar reluctance and appetites might surface.

Once proven, the technology will be available to all comers. Under these conditions, many businesses, not just corporate giants, will be able to compete.

As a result, the retail stores where we buy software today could give us access to software on tap — more, better and cheaper titles that come independent of the storefront overhead normally associated with stocking products.

Let's just hope they also come free of any political overhead. The experiment will have been a failure if only the software we buy off the shelf today is available via online CD publishing. □



JEAN-LOUIS GASSÉE

LETTERS



Clement Mok design proposal was a competitive offer

The story "Rapidly growing start-up puts its Macs to the test" (MacWEEK, April 26) contained inaccurate information about Clement Mok Designs Inc.

In 1991, CMD was asked to bid on a packaging system for the start-up described in the story. We submitted a proposal for \$33,500. The astronomical amount mentioned in the story is not based on fact.

CMD is proud to provide significant value to our clients at competitive prices.

Shel Perkins, vice president for operations
Clement Mok Designs Inc., San Francisco

Font foundry has own take on merits of MacWEEK points

The caption to the illustration in the story "Type industry at crossroads" (MacWEEK, March 29) contained comments that are largely erroneous.

The comment that "... too many points can slow (or in extreme cases, stop) the RIP at output time ..." seems to imply that FontBank Inc.'s display typefaces can cause slowing or stopping of a RIP (raster image processor) or other output device. This is untrue. "Too many points" is clearly defined by Adobe Systems Inc.'s own specification that 1,500 points on a single path is too much, not the 52 points in three paths contained in the FontBank character illustrated.

Adobe has defined hinting to be a consideration only with typefaces run at 9 points or smaller on output devices of 300 dpi or less. Thus, hinting is not and never has been an issue in regard to the proper use of any FontBank typeface.

The caption points out "point at top of letter" as if this is some kind of sin — ignoring that the Monotype letter as illustrated has a point at the top of the letter. Anyone with PostScript rendering experience knows that placing a point at the top of the letter is often the only way to properly define the curve.

The comment "Curves do not appear to continue as smoothly as they should" is meaningless. FontBank typefaces are faithful reproductions of the originals from which they were hand-drawn, not auto-traced as implied. Not liking the design from which they were rendered is a personal opinion, not grounds for valid criticism.

The illustration is of one character chosen from the more than 20,000 in the FontBank Type Companion library of 250 display typefaces. Every font publisher has characters that it is not proud of, but irregularities happen, and they do get corrected in subse-

quent releases. Typeface renderings are indeed creatures of evolution.

Choosing digital typefaces for purchase is a difficult enough chore without littering the road with invalid and erroneous criticisms of the kind chosen in this fallacious "caption critique" of a single FontBank character.

Jerry Saperstein, president
FontBank Inc., Evanston, Ill.

Writer Kathleen Tinkel replies: The maximum number of points per path in PostScript is hardly germane in this context. Type 1 fonts fall under a different rubric than general graphic objects in PostScript. But fonts are used in great number, and it is the cumulative data a RIP must deal with that can cause problems.

To say "Adobe has clearly defined hinting to be a consideration only with typefaces run at 9 points or smaller on output devices of 300 dpi or less" is simply untrue. For one thing, you can't say that about hinting — it's in effect as long as there are insufficient pixels available to represent the outline accurately. On some fonts that could mean that hints are effective at 14 points, 24 points or even larger; or at 600 dpi or higher.

But Adobe also sells display fonts — Lithos, Trojan, ITM Machine, to name a few — that are all superbly hinted. Why would that be true if hinting is irrelevant at typical display sizes?

It was indeed an error to refer to the "point" at the top of the letter. It should have been called a "bump." A point at the top is virtually required. The bump is a mistake.

Regarding the design, since FontBank has labeled this particular font Times Roman, the design is a matter of record and not of my personal opinion. All the lines continue smoothly in Times Roman from such sources as Linotype, Adobe and Monotype, although they do not in the FontBank font. This is a failure of the renderer.

As to whether or not this character is representative of the "more than 20,000" in the FontBank library, I selected several FontBank faces chosen at random to examine the lowercase "g." Consider Baskerville. FontBank has clearly used a different Baskerville (there are many related designs of that name). There are clearly visible differences in the comparable parts of the letters. In each case, Adobe's outline is spare, accurate and hintable, while FontBank's is not.

There is only one Italia, and FontBank's "the-saurus" said Italinate is a copy of it. But an examination of the terminals (tail and ear) reveals that they're not even the correct shape. It also reveals that there are extra and wrongly placed points around the forms of the letter in FontBank's version.

Send letters to MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MCI 323-1203; Internet, letters@macweek.ziff.com; fax (415) 243-3650. Include your name, address and phone number. Letters should not exceed 300 words. We reserve the right to edit for clarity and length.

The Mac Manager

Intel in Mac OS clothing will bring in the bucks



DON CRABB

In the May 10 issue of MacWEEK, my colleague across the fold, Jean-Louis Gassée, wrote a column ("Will Apple avert nightmare if it puts OS on Intel?") that really got me thinking about the future of Apple. Jean-Louis makes an intriguing point, that Apple is wasting valuable time and resources on an Intel version of the system.

Considering that Apple has an absolutely dismal record of shipping system software on time, the point's well-taken. Perhaps the company shouldn't be wasting time on non-mainstream system software since it can't get its primary products out the door in a timely manner. And as Jean-Louis persuasively argues, what Apple should be doing is moving its entire business toward the PowerPC-based Macs of 1994.

The only problem with these arguments is that following this path will kill Apple in the long run. If Apple could remain viable primarily as a hardware vendor, I could buy it. But Apple can't. As cutthroat as all computer hardware markets have become in the past year, the future's even more bleak, all those potential PowerPC-based Macs notwithstanding. Whether we want to admit it or not, computers have become commodity items, like other office equipment.

As a result, the operating margins of some hardware companies have slipped so much in the past year that single-digit margins are no longer unthinkable. No matter how lean Apple becomes, it just can't exist down in that rarified territory.

A matter of choice. As Mac managers, we've already seen the early results of the commoditization of computers. We're under increasing pressure to justify the cost of every bit of new equipment we buy.

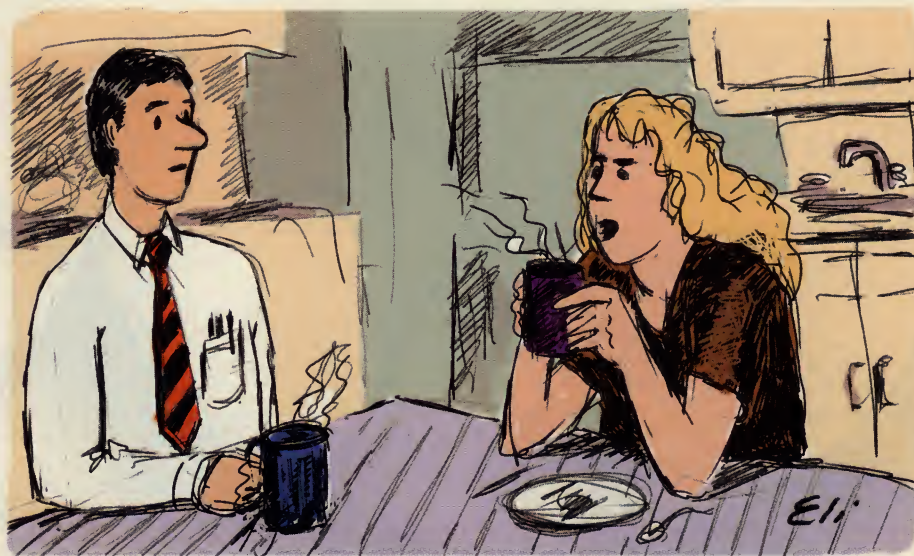
Despite Apple's ongoing price decreases, our bosses still see Macs as the high-price spread. Recent defections to Windows clones and Unix workstations at very large Mac sites drive home the problem. Those companies don't see the Finder or Apple's system services alone as justifying the higher Mac hardware costs.

This illustrates Apple's real dilemma: Despite its superior graphical user interface, innovative system services such as AppleScript and AOC (Apple Open Collaboration Environment), and hot imaging and video technologies such as QuickTime and QuickDraw GX, its technologies run on only one-tenth of all the installed computers in this country.

The software imperative. The only way to its share is for Apple to get the system, Finder and all the rest onto Intel machines. Apple has really always been a software company, despite the billions it has made selling hardware. The reason we've bought Macs is the system. Even in 1993, it's ahead of the offerings on Intel platforms.

But the competition is catching up and coming from all sides of the 32-bit pre-emptive forest. That's why I ultimately disagree with Jean-Louis' thesis about the Intel Mac system.

Yes, Apple must grow its business into PowerPC-based Macs by pouring substantial resources into making Mac software run seamlessly and quickly on them. But that doesn't rule out Apple pushing its system prowess onto other architectures, where the potential sales will help fund the next Macintosh revolution. □



"You've been telecommuting for a year now, time to lose the tie."

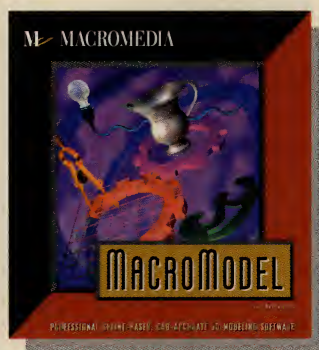
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PRESENT IT TO YOUR CLIENT
AND GET IT INTO PRODUCTION—
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Bicycle designed by
Michael Jung Lee & Li-Chih Fu and
modeled with MacroModel by Dan Meblin.

completely interchangeable between platforms.

MacroModel simplifies professional-quality model-making for product prototyping, mechanical designs, desktop publishing, multimedia and any other application that requires real-world imagery.

And it does it with a collection of familiar tools that deliver every bit of the speed and performance you need for modeling and smooth-shaded rendering in real time. If they were any faster it would be *unreal*.

IF YOU CAN MOVE A MOUSE, YOU CAN MAKE A MODEL.

In the past, a course in quantum physics was easier to grasp than most computer-based modelers.

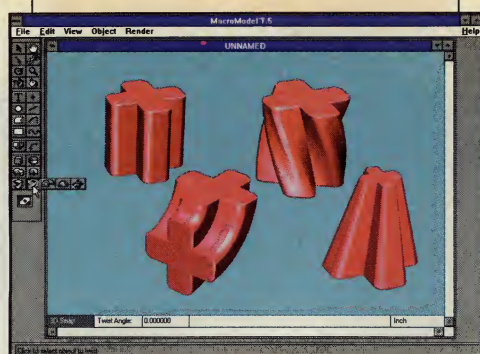
Now, even if you can't tell an X-coordinate from a Z-axis, you can extrude, sweep, skin and lathe like a pro. In fact, MacroModel's straightforward interface is more similar to 2D illustration and CAD software than existing 3D modeling programs.

You can build and edit objects in a 3D world, rather than in separate 2D design windows. You have the option of modeling in fast smooth-shaded mode, instead of wireframe only. And it takes just two mouse clicks to move in or out of the third dimension.

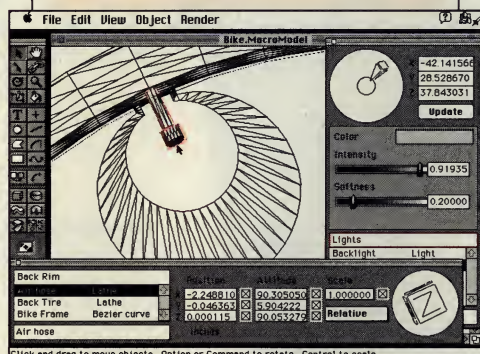
(Only Rod Serling could have made that any easier.)

THE MODEL OF PERFECTION.

So it doesn't take a rocket scientist to use MacroModel. But since you just might need a

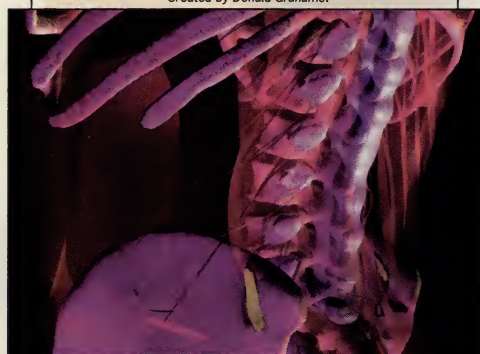


MacroModel's interface makes complex modeling easy with many of the familiar tools found in CAD and spline-based 2D illustration programs. You can even twist, bend and taper objects with the click of a mouse.



Interactive browser boxes, containing a "virtual trackball" and "virtual joystick," offer precise control of individual objects, views, light sources and materials.

Created by Donald Grahame.



MacroModel is available with RenderMan for precision modeling and photorealistic rendering. The program also supports Three-D, Swivel 3D Pro, 3D Studio, AutoCAD, Claris CAD, QuarkXPress, Illustrator, Photoshop and Director.

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rocket scientist's level of detail, our "double precision floating-point" technology ensures accuracy to the sixth decimal place—that's equal to the finest CAD programs.

You can create objects relative to each other in the 3D world and edit their spline-based control points intuitively by sight or precisely by the numbers. Place points and objects right where you need them with our advanced 2D and 3D snapping tools. Apply colors, shades and materials to your modeled objects, and render scenes with life-like shadows and lighting effects.

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equivalent of eighty-eight 3.5-inch double-density disks.) And because they're removable, and each data cartridge has a life of 30 years, you have virtually unlimited capacity for all of your storage needs.

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from your fax machine and request document 1367.

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Reviews

► Reviews Forum. See Page 72.
► Coolscan and mira•35. See Page 74.



The second coming of Ofoto shows true colors on desktop

Light Source's product isn't perfect, but it brings accurate desktop color scanning closer to reality.

By Bruce Fraser

The long-awaited color version of Ofoto scanning software, originally bundled with Apple's Color One-Scanner (see story, Page 72), is now available as a retail product. Billed by its developer, Light Source Computer Images Inc., as "the expert operator for your desktop scanner," Ofoto 2.0.1 isn't perfect, but it brings the idea of accurate and automatic desktop color scanning a giant step closer to reality.

Version 2.0.1 is extremely well-suited for use with low-cost desktop color scanners and printers. In addition, the results produced by OfotoColor, the product's underlying color-matching technology, are good enough to imply that the software clearly has a future beyond the realm of eight-bit flatbed scanners and inkjet or thermal-wax printers.

With a list price of \$395, Ofoto 2.0.1 supports a variety of scanners from Agfa, Apple, Epson America Inc., Hewlett-Packard Co., La Cie Ltd., Microtek Lab Inc. and UMAX Technologies Inc. (see chart, Page 70).

Adaptive calibration. Ofoto achieves color accuracy using a method that Light Source calls "adaptive calibration," which produces a closed-loop calibration specific to a particular scanner and printer combination. Creating this calibration is a two-step process. First, you bring up Ofoto's built-in adaptive calibration color chart and either save it as a file — which you can then print out of other applications — or print it directly from Ofoto itself. Then you take the printed target and scan it back into Ofoto. The software uses the scan to create a calibration for that scanner-printer combination. Once you've created the appropriate calibration for your system, you can use Ofoto as an automatic scanning utility.

Unlike almost every other color-management system available for the Macintosh, Ofoto isn't based on the CIE reference color space.

Instead, it uses a proprietary color space that's visually linear; that is, an incremental change in color values will produce the same perceptual change in the color anywhere in

the entire spectrum. By using this color space, Light Source claims, Ofoto can avoid many of the problems caused by rounding errors that occur in a CIE-based approach. The results we've obtained seem to largely support the company's approach.

Ofoto also offers a simple monitor-calibration process, which it uses when displaying images on screen. You drag a slider until a two-tone gray bar appears as solid gray and enter a value for the color temperature of the monitor. However, this calibrates the monitor only for Ofoto; it doesn't replace system-level monitor calibration that can be used by all applications.

Automatic mode. In fully automatic mode, Ofoto detects the type of original being scanned and creates a gray-scale, line-art or color scan at the appropriate resolution for the selected printer. It



In fully automatic mode, Light Source's Ofoto 2.0.1 detects whether the original is a color or gray-scale photo or line art, and it selects the appropriate scanning mode. It determines the required resolution based on information contained in the selected calibration. Automatic exposure settings, sharpening and descreening are also available.

automatically crops the image, applies sharpening and tone correction, removes background moiré from screened originals, and straightens images that have been placed askew on the scanner bed. If you want, you can turn off any of these automatic operations. You can also specify a height, width or scaling percentage, which is automatically applied to the scan, resulting in a correctly sized scan for your particular purpose.

This approach works well as long as you want to faithfully reproduce the original. But often you want to

modify the original in some way, such as correcting a color cast or compensating for overexposure or underexposure. Ofoto contains some limited but nonetheless effective tools for global color-cast removal and tone manipulation, but the product has little to offer in the way of selective image-modification tools. The only selection tools are the Marquee and the Lasso, and you can't feather the edges of selections, so any drastic changes to a selection result in unnatural-looking edges. The only retouching

See Ofoto, Page 70

VIDI throws curves at 3-D modeling

ModelerPRO hums, Presenter needs work

By Timothy E. Johnson

Visual Information Development Inc.'s \$2,995 Presenter Professional is one of the better examples of a spline-based surface modeler because of its fresh approach to modeling. The package uses Digital Clay as its intuitive surface medium, and grouping similar to the Finder's hierarchical folder structure is used to represent complex designs and animation. Presenter Professional's renderer includes basic keyframe animation and offers Phong shading, ray tracing and one of the industry's best interfaces for producing photo-realistic images through Pixar's RenderMan.

Model citizen. Presenter Professional's modeling environment, ModelerPRO, is actually a separate application that is integrated with the animator-renderer, Presenter.

ModelerPRO uses the familiar Top, Front, Side and Perspective views to represent space, but the resemblance to other programs ends there. The Perspective view quickly shows a flat shaded view of your object. Curves

and shapes deform simultaneously in all four windows as you draw them. Most modelers impair visualization by showing only the action in the active window.

See Presenter Pro, next page

score card

Presenter Professional

Visual Information Development Inc.

Overall value ♦♦♦

Version tested: 1.5.2

List price: \$2,995*

Presenter Professional is two integrated applications: a spline-based surface modeler, ModelerPRO, and an animator-renderer, Presenter. The program uses hierarchical grouping similar to the Finder's folder structure. The modeler is highly accurate and has many CAD features that work in 3-D, as well as intuitive ways to create difficult surfaces, including Digital Clay. The modeler imports and exports an amazing number of foreign file formats. The separate animator-renderer isn't nearly as polished, however. It lacks some mapping features, its light sources need work, and the animation tools are not very slick. For the price, VIDI needs to incorporate the renderer and bring it up to the excellent level of the modeler.

Performance ♦♦♦

Features ♦♦♦

Ease of use ♦♦♦♦

Documentation/support ♦♦♦

* Upgrade price \$195; competitive upgrade, \$2,495; ModelerPRO is available separately for \$1,995; Presenter Xpress, \$995.

score card

Ofoto

Light Source Computer Images Inc.

Version tested: 2.0.1

List price: \$395*

Overall value ♦♦♦♦

The color version of Light Source's automatic scanning application excels in producing printed output that very closely matches the original. It does so without user intervention, which is a first on the desktop. This release is a bit slower than we'd like, particularly for pre-press resolutions, but it's fast enough for desktop color output devices. The quality of the color matching is the best we've seen so far from any color-management system. Currently, Ofoto saves color calibration settings to files, which means you'll need to save individual versions for each output device. As support for Apple's ColorSync takes hold, however, this situation will disappear, further increasing Ofoto's utility.

Performance ♦♦♦♦

Features ♦♦♦♦

Ease of use ♦♦♦♦

Documentation/support ♦♦♦♦

* Upgrade from Version 1.x, \$95.

RATINGS KEY

♦♦♦♦ Excellent
♦♦♦♦ Very good
♦♦♦ Good
♦♦ Fair
♦ Unsatisfactory

Presenter Pro *From previous page*

With ModelerPRO, you always draw in a plane parallel to the active window. Establishing your drawing depth couldn't be easier — you merely point at the level in an opposing window and press the space bar. This relieves you of the inconvenience of moving an object to the correct depth after its creation. You cannot, however, draw in the Perspective view.

CAD features. The program has many CAD features that work in 3-D. You can hold down the Command key as you draw to snap through the third dimension to key points in the active window. The key point types are vertexes, midpoints, circle centers, intersections and grid points. Although you cannot snap objects to an edge, you can align two objects to a common edge on the same plane.

ModelerPRO supports other important CAD features. You can trim lines and splines anywhere along a curve or exactly at an intersection. Symbols show either as instances coupled to a master drawing or as uncoupled groups.

VIDI claims ModelerPRO is accurate to eight places, but testing revealed it is truly accurate to six places, which is more than adequate for most modeling needs. For precise sizing, you can type an element's principal dimensions into the program's Information Bar. You use the same bar to constrain an object's length, angle and position as you draw.

Creating shapes. Like other modelers, you can create shapes in either constructive or additive manners. You can also use ModelerPRO's Digital Clay

feature to "pat" or stretch a form into shape.

Constructive modeling refers to creating 3-D surfaces out of 2-D contours. You may extrude 2-D splines either straight up, at an angle to produce cylinders or along a path to create pipes. A lathed object's axis of revolution can lie at any angle. Arbitrary forms take shape with the Loaf tool, which stretches a smooth skin over a series of cross sections. You can rotate the skin as it is applied, to maintain the proper relationship of points on two planes.

Sweeping a 2-D object lets you

The most remarkable feature of Presenter Professional is its hierarchical grouping. It lets you manipulate and hide groups of elements by name.

duplicate it around any axis and change its size and height with each step. This allows you to create organic-looking shapes such as a nautilus shell or helix.

It's also easy to create beveled objects — crucial for animators — with the Bevel Extrude command.

Additive modeling combines predefined shapes, called primitives, to create more complex shapes. Presenter Professional has tools for creating boxes, wedges, pyramids, cones, cylinders, spheres and doughnuts.

These objects retain their principal metrics so you can reshape them by altering their underlying dimen-

sions in the Information Bar. Alternately, you can decompose them into a spline surface mesh for reshaping as Digital Clay.

Modeling with Clay. Digital Clay is VIDI's term for one of its surface-reshaping methods — the program actually gives you three surface-editing choices. Like other spline modelers, you can select a point where two riblike splines intersect and move either the intersection or the splines' tangency handles that originate at the intersection. You can insert new control points on the surface if you want finer control.

You can also use the unusual Reshape command to scale or rotate selected spline intersections. This technique makes it possible to taper a cylinder to a fine point or bend a rod like a piece of neon tubing.

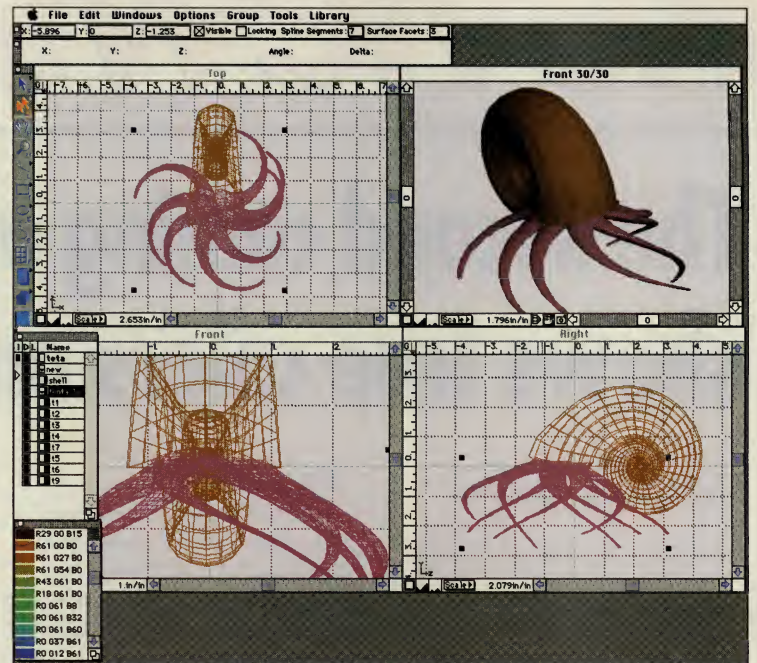
The claylike method for editing surfaces works on an isolated surface patch rather than a collection of disconnected points. The patch must have four sides, but it can contain any number of riblike splines. You control the surface curvature at the patch's four corners by moving the corner tangency handles, or you can dimple the patch by pushing or pulling the interior points.

Despite this flexibility, the program lacks a straightforward method for matching edges across adjacent surfaces. This is important for guaranteeing continuous reflections across neighboring surface patches when rendering, and VIDI should address this limitation in the future.

With Presenter Professional you can measure surface areas and volumes, which is a boon to package designers. Logo designers will appreciate the program's ability to convert any PostScript font (but not TrueType) into a spline-edged surface contour ready for constructive modeling. We did have trouble converting some characters, particularly "8" and "B," which required some manual tweaking to get to surface properly.

Hierarchies. Presenter Professional's most remarkable feature is its hierarchical grouping. It lets you manipulate and hide groups of elements by name. More importantly, you can nest elements to simulate linked motions in the animator, such as the limbs of a dancer. Groups display as a tabular outline in a palette. The indentation shows the hierarchy.

Presenter Professional uses several types of groups to organize the hierarchies. An Object group holds any number of graphical elements that share similar features, such as the same texture. A Folder group stores several Object groups. Folders give the groups their hierarchical structure and behave like the Finder's folders. You change group assignments by dragging other



Presenter Professional uses a powerful grouping system, analogous to System 7's outline folders, to organize the many parts of a 3-D model. Highlighting a group in the palette (middle left) selects it for modification, such as changing colors (bottom left).

groups into Folder groups.

The Library group holds both Folders and Object groups. You use Library groups to make multiple insertions that update automatically when you change the original. Grouping in Presenter Professional makes your design structure visible so you can rapidly move, rotate, resize, duplicate and paste elements en masse. You can also define rotation points for a group that will maintain their hierarchical relationships during animation.

While building models and creating animation, hiding groups you're not working on vastly speeds up screen redraw.

The modeler communicates well with the outside world. It imports DXF (Drawing Interchange File), Encapsulated PostScript, PICT, Computervision Corp.'s VersaCAD, IGES (Initial Graphic Exchange Specification) and Aldus Corp. Consumer Division's Super 3D files. It exports 3-D models in VersaCAD, RIB (RenderMan Interface Byte-stream), Wavefront Technologies' WaveFront, Electric Image Inc.'s FACT, Strata Inc.'s StrataVision and DXF formats. Renderings can be exported as PICT, EPS, PICS and QuickTime files. We found that both the 2-D and 3-D DXF imports worked well.

Rendering. You must transfer to the rendering application, Presenter, to find the tools for setting lights and applying textures. The renderer uses either Phong shading or ray tracing to generate photo-realistic stills using 32-bit color. Having these functions separate from the modeler is a pain. You'll spend too much time unloading and reloading the modeler and renderer to care for this artificial division. VIDI plans to unify the two pro-

grams in the next version. The company also currently sells the modeler alone as ModelerPRO for \$1,995.

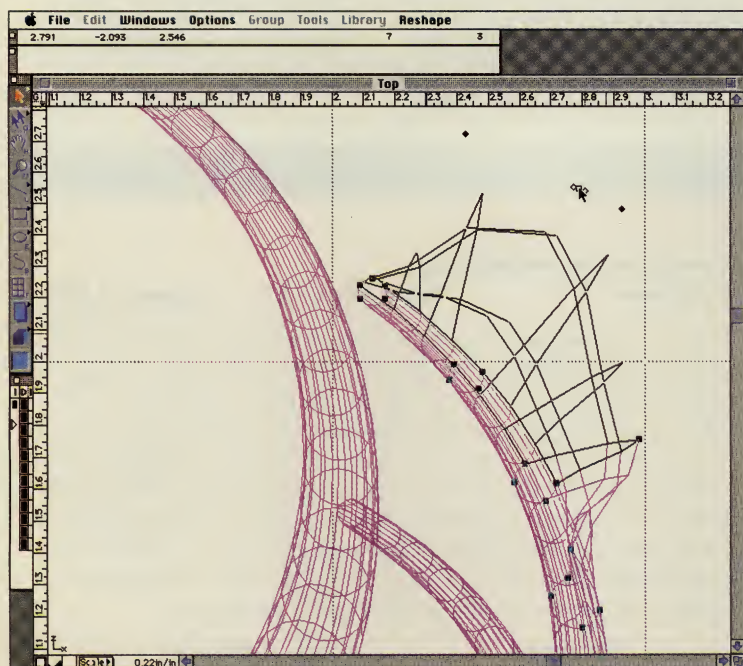
The renderer has other problems, though. The point, spotlight and sunlight sources misbehave. You must set the lighting intensity for these sources with sliders, which limit your maximum brightness levels. It's as if your entire lighting supply was confined to 100-watt bulbs, and you really needed a few 300-watt floodlights to make the scene sparkle. Spotlight control is limited to color, orientation and cone angle. You cannot control a spotlight's range or its focus, so pools of light always appear sharp-edged. We couldn't get the point-light source to cast shadows. We'd also like to be able to apply gels to lights and make lights visible.

You define materials by their optical properties — such as color, reflectivity, transparency and index of refraction — and their associated procedural, bump and texture maps. Texture maps are color PICT files that wrap around spline meshes like patterned rubber sheets. Bump maps are gray-scale PICT files that define texture-height variations based on the amount of black. Procedural maps are mathematical routines that produce grained textures such as stone and wood.

There is no provision for transparency maps that specify where an object becomes transparent, or environmental maps for reflecting skies and other surroundings off your shiny materials.

You must render the entire scene to see the effects of a single material choice. Although you can speed things up by rendering at low resolutions or by hiding all the objects except for the questionable one, it's still slow going compared with sam-

See Presenter Pro, Page 70



VIDI's modeler, ModelerPRO, is one of two main parts to the Presenter Professional package. Its strongest feature is the way it lets you manipulate spline-based objects, much like 2-D programs such as Adobe Illustrator let you modify Bezier curves.

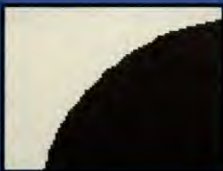
Before you buy theirs, you'd better see ours.



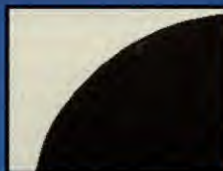
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Presenter Pro

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pling a cropped subset of your scene or even offering a thumbnail-size preview of your texture choices, which other renderers offer.

Presenter Professional's Phong shader does more than the competing smooth shaders. It renders transparent material properly, but it uses large amounts of RAM to do so. Both the Phong shader and the ray tracer remove jaggies with their built-in anti-aliasing.

YARC support. Presenter's ray tracer is slower than some competitors, but if rendering times are a significant concern, you can quash the problem with one of YARC Systems Corp.'s NuBus boards and VIDI's \$995 Presenter Xpress add-on. YARC's boards use a high-speed RISC processor and on-board RAM to accelerate any program that accesses its specialized instruction set. VIDI was one of the first 3-D vendors to support this board. Rendering on a Mac IIci with a 40-MHz DayStar Digital Inc. Turbo 040 and a 16-Mbyte YARC NuSprint (priced at \$3,995, bundled with YarcRenderMan) was nearly three times faster than without the YARC board, and faster models of the YARC are available.

RenderMania. Presenter is the best of the lot in terms of RenderMan support. Serious users of RenderMan will find Presenter's support of Pixar's rendering system significantly better than that of Pixar's own Showplace. Presenter passes its spline information directly into RenderMan rather than breaking your model into facets. Presenter's lights cast shadows in RenderMan, and you can edit

RenderMan shaders from within Presenter Professional, a capability Pixar plans to add in its as-yet-to-ship Glimpse product.

For the ultimate in modeling power, you can use Presenter's hierarchical grouping structure to pass closed objects to RenderMan as solids. RenderMan then carves up the first object in a folder with the remaining objects according to the Boolean operation you've associated with the folder — either union, intersection or difference.

Animation. The animation capabilities of Presenter are basic, and they are accompanied by some frustrating limitations. You cannot select objects by clicking and dragging — you have to select objects in

Presenter Pro's modeler will meet your most stringent modeling requirements, if you can meet its price.

the Group window, open a dialog box, and type in rotation and position values. Even though you can edit splines in the modeler with ease, you cannot deform objects at all in the scene builder, so morphing isn't an option. Finally, keyframes apply to all objects, and they cannot be restricted to individual objects, so it's difficult to create nested motion.

Documentation and support. Presenter Professional's documen-

tation is not bad, but it is uneven. VIDI makes amends with very good technical support and a videotape to get you started. On the downside, VIDI shackles the users with yet another Apple Desktop Bus-based copy-protection device.

A competitive upgrade offers \$500 off the price with a trade-in of "any modeler."

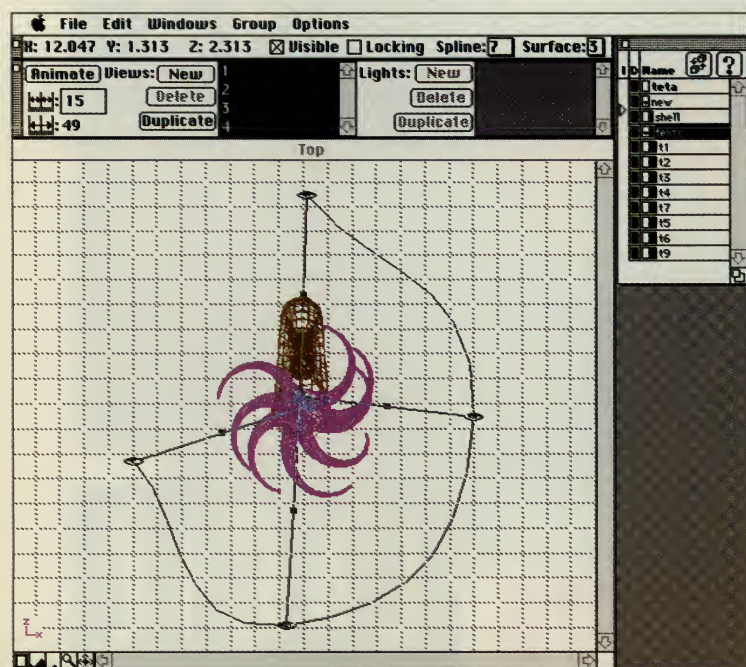
Conclusions. Presenter Professional's spline-based surface modeler, ModelerPRO, is superb. Features such as Digital Clay and the unique hierarchical grouping structure give this accurate modeler flexibility and power.

On the other hand, the separate rendering package, Presenter, is inconsistent. You have limited control over the lighting sources, and important mapping techniques and previsualization features are missing. The ray tracer is somewhat slower than average unless you accelerate your Mac with the YARC board and Presenter Xpress.

The tables turn if you use RenderMan. Presenter correctly passes shadow, lighting and spline information to RenderMan, allowing you to bypass Pixar's Showplace completely, and you can edit the RenderMan texture shaders from within Presenter. Presenter also uses its hierarchical grouping structure to pass closed objects to RenderMan for Boolean modeling.

Presenter Professional's modeler will meet your most stringent modeling requirements, if you can meet its price. If you are not interested in animation capabilities, the separate ModelerPRO package is a better buy right now. We feel a package this expensive should have a renderer that performs as well as the modeler. As we went to press, a VIDI representative told us that a forthcoming major upgrade would address many of our concerns about the renderer, as well as integrate the modeler and renderer into a single application. Hopefully, the company can bring the whole package up to the high level of quality found in ModelerPRO.

Visual Information Development Inc. is at 16309 Doublegrove St., La Puente, Calif. 91744. Phone (818) 918-8834; fax (818) 918-9935. □



While the animation and rendering module of Presenter Professional provides Phong and ray-tracing features, it is not as well-developed as other programs on the market. The animation interface, which lets you move your point of view and lights by dragging them around, is easy to use, but basic; and it doesn't allow you to create nested motions.

Ofoto-supported scanners

- ▶ Agfa Arcus
- ▶ Apple Scanner (4-bit), OneScanner and Color OneScanner
- ▶ Epson America ES-300C (GT-6000), ES-600C (GT-6500) and ES-800C (GT-8000)
- ▶ Hewlett-Packard ScanJet (4-bit), ScanJet Plus, ScanJet IIp and ScanJet IIc
- ▶ La Cie Silverscanner
- ▶ Microtek Lab 300GS, 300ZS, 600GS, 600ZS, ScanMaker II and ScanMaker IIxe
- ▶ UMAX Technologies UG630, UC630, UC840 and UC1200S

Ofoto

From Page 67

tools are an eyedropper for picking up colors from an image and a pencil for pixel-by-pixel retouching. If you need to do any serious manipulation to the image, you'll almost certainly want to bring it into a more full-featured image-processing application such as Adobe Photoshop; Ofoto is an adjunct to, rather than a replacement for, such programs.

Ofoto does sharpening on the fly, but the sharpening algorithm is quite gentle. We found that some originals benefited from an additional round of sharpening after scanning. Ofoto also offers a Focus control, which works a little differently from sharpening: It seems to work best when used for correcting out-of-focus originals; on "normal" images the effect tends to be overdramatic.

Controlled tones. For tone manipulation, Ofoto offers two controls: one for highlight and shadow and one for brightness and contrast. Normally, Ofoto automatically calculates the highlight and shadow values during the scan, but in some cases you may want to override this. That's where the Highlight and Shadow control comes in. It essentially defines the dynamic range of the image (anything darker than the shadow point will be black, and anything lighter than the highlight point will be white), but it has one more interesting wrinkle: It allows you to set the color, not just the level, of highlights and shadows. This can be useful when scanning originals that were printed on discolored or non-white paper.

Ofoto's Brightness and Contrast control works a little differently from most other applications. It leaves the highlight and shadow points unchanged and operates only on the midtones, functioning more like a Gamma control. Both sets of tone controls work interactively — the on-screen image changes to reflect the settings — and can be used either as post-scan tweaks or as settings for the scan itself. You can also make subsequent scans inherit these tone settings if you're scanning several originals with similar tone requirements.

The Color Correction control is interesting in its approach. You select a color in the image that you want to change and a color that you want to change it to. Ofoto then adjusts all the colors in the image. This approach is well-suited to matching important colors in two images. Light Source offers the example of photographs of a football game that begins in daylight and ends under floodlights. The colors of the grass and the uniforms will be quite different in the sunlit and floodlit shots, but Ofoto makes it easy to match them. For more-general color correction, however, this control is a little trickier. It demands a good eye and a working knowledge of color to remove color casts without drastically altering the image.

Documentation. The documentation, which includes plenty of color images, is clear and well-organized. Thanks to Ofoto's clean interface, however, we suspect most users won't have much cause to reference it.

Out of sync. The major problem with Ofoto is one that isn't of Light Source's making. Because most printer drivers don't support Apple's ColorSync color-management architecture (the Apple Color Printer is the only one with a ColorSync-compatible driver), Ofoto applies its calibration when you save the file. The problem with this approach is that you end up with a file that's device-specific: It will give good color only when printed to the device for which it was targeted. If you want to print the image on multiple printers, you'll need to save separate versions, one for each output device.

When printer drivers that support ColorSync become widespread, the need for these workarounds will disappear. OfotoColor will kick in and apply the appropriate calibration at print time, and you'll be able to keep one general-purpose raw scan for each image. However, it's unlikely that we'll see a ColorSync-compatible PostScript driver before year-end.

A further problem associated with this approach is that while cali-

See Ofoto, Page 72

SYSTEM 7 COMPATIBILITY

Presenter Professional 1.5.2

Balloon help	No
TrueType	No
Publish and subscribe	No
Apple events	No
32-bit addressing*	Yes

*According to vendor.

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Ofoto

From Page 70

brated images look normal in Ofoto, they will often look washed out when you open them in an application such as Photoshop. If you want to use Photoshop to retouch the image or to apply selective sharpening to parts of the image, the work-around is to save the file in Ofoto using a raw calibration (which leaves the color data unchanged), do the work in Photoshop, then bring the file back into Ofoto to apply calibration for the particular output device.

Room for improvement.

While there's little Light Source can do about the ColorSync situation, there are some improvements that could easily be made to Ofoto. For example, it isn't particularly fast. This shouldn't be a problem if you're scanning for output on a low-resolution desktop printer, but at scan resolutions of 200 dpi and above, it's quite slow, especially if you're rotating an image.

The process of saving and calibrating an image is also quite slow, particularly with larger scans. Ofoto would be more productive if,

before initiating an automatic scan, you could name and save it. As it is, you have to perform the scan, which, depending on the automatic tasks chosen, can take some time, particularly if straightening is required, then return to the Mac to name and save the image. This can take several minutes for a scan in the 4-Mbyte range.

We'd also like to see more keyboard shortcuts implemented. For example, Ofoto's tool palette has a grabber hand and two zoom tools, one for zooming in and one for zooming out. It would be conve-

nient if these tools were accessible by the same keyboard shortcuts as their Photoshop equivalents.

Lastly, we'd like to see better support for scanners such as the Agfa Arcus and UMAX UC1200S, which both scan at more than eight bits per pixel per color. At the moment, Ofoto treats them as eight-bit scanners, sacrificing some of the quality of which they're capable.

Conclusions. These shortcomings aside, Ofoto 2.0.1 represents a breakthrough in desktop color. It's the first application we've seen that

will allow even a complete novice to scan an image, print it and have the print closely resemble the original. We were able to achieve very good color matches from automatic scans on a wide variety of low-cost color printers, but the results on high-end dye-sublimation printers and Matchprint proofs were equally good.

From a productivity standpoint, Ofoto clearly needs improvement before it will be useful in a pre-press setting, but it's certainly fast enough for scanning for desktop color output devices. More importantly, the underlying color-management technology is the first we've seen that offers complete scanner-to-monitor-to-printer matching without relying on vendor-supplied device profiles or hardware monitor-calibration utilities. As such, it holds immense promise for the future. For now, if you want automatic scanning and can put up with the inconveniences noted above, Ofoto offers good value and surprisingly high quality.

Light Source Computer Images Inc. is at 17 E. Sir Francis Drake Blvd., Suite 100, Larkspur, Calif. 94939. Phone (415) 461-8000; fax (415) 461-8011. □

Solid performance from Apple's Color OneScanner

The Apple Color OneScanner, Apple's first foray into the color-scanner market, is a decent — if unspectacular — effort. The most exciting aspect of the offering is the inclusion of Light Source Computer Images Inc.'s Ofoto 2.0.1 (see story, Page 67) as the scanning software, which in large part vindicates Apple's vision of color scanning as just one more component in everyday communications.

The scanner hardware displays Apple's usual plug-and-play simplicity. The only control is the power switch, and the front panel has a power-on indicator and another lamp that indicates when the scanner is busy, when a hardware fault has been detected and when the lamp needs replacing. The SCSI ID selector is a push-button switch, and the scanner is externally terminated.

Ofoto is responsible for so much of the scanner's performance that it's quite difficult to evaluate the scanner itself. However, we used Ofoto with other scanners and ran our usual battery of synthetic tests, using Ofoto simply as a "dumb" scanner driver, with all automatic operations and calibration turned off. By doing this, we were able to come up with a fairly clear picture of the strengths and weaknesses of the scanner hardware.

We found that the scanner has excellent gray balance, surprisingly good shadow discrimination for an eight-bit scanner and excellent lamp stability. We didn't find any trace of jitter in the mechanism, and the CCD (charge-coupled device) displayed relatively little noise. In general, the scanner compares favorably with other eight-bit, 300-dpi models. The color filters seemed quite broad in their bandwidth, so the purity of saturated colors wasn't as good as on our favorite eight-bit scanner, Hewlett-Packard Co.'s ScanJet IIc, and the blue channel was noisier than ScanJet's. However, the stability of the light source and the shadow performance were better than ScanJet's, and the noise levels in the red and green channels were similar on both.

One minor annoyance is that only the top of the scan bed has a raised edge, which can make it difficult to place artwork straight on the scanner. Ofoto has an automatic straightening feature, but it adds considerably to the scan time. We'd have preferred raised edges on all four sides of the bed.

We also uncovered a potentially more serious problem. Some of our scans exhibited what at first appeared to be bad registration; we saw color

fringes along edges in the image. Closer inspection revealed that the problem was actually caused by corruption of the data in the blue channel: Entire rows of pixels were displaced by 22 or 29 rows. When we contacted Apple, company representatives told us they'd seen the condition only once in internal testing and had been unable to reproduce it. It seems to be a SCSI timing problem that appears only on Mac II machines that have been upgraded to Mac IIx models, and even then only with certain SCSI configurations. We were able to reproduce the problem on our upgraded IIx but not on any other CPU. Apple is investigating the situation. If you have an upgraded IIx, you may want to make sure you have some kind of money-back guarantee in case you run into this problem.

Aside from this somewhat obscure problem, we found the Color OneScanner well-behaved; even on our problem configuration, it didn't cause any other SCSI difficulties, and it displayed no other unusual behavior. At a list price of \$1,349, which includes Ofoto 2.0, it's money well-spent.

Those who already own a Color OneScanner should note that the retail version of Ofoto 2.0.1 is slightly different from the bundled version; a free upgrade is available from Light Source on request. — By Bruce Fraser

SYSTEM 7 COMPATIBILITY

Ofoto 2.0.1

Balloon help	Yes
TrueType	n/a
Publish and subscribe	No
Apple events	Yes
32-bit addressing*	Yes

*According to vendor.



Casady & Greene's A.M.E. has limitations

Your review of Casady & Greene Inc.'s Accessed Managed Environment (MacWEEK, April 12) failed to point out several significant limitations introduced in the System 7-compatible Version 2.1. Unlike earlier versions, A.M.E. no longer allows the administrator to control access to control panels. Limiting reconfigurations of utilities was one of the key reasons we originally bought A.M.E. for our Macintoshes, but it is now impossible. (During beta testing of Version

2.1, Casady & Greene acknowledged the problem but did not commit to addressing it.)

The review also didn't point out that using A.M.E.'s "trusted software" feature to allow only registered applications to run can add 30 seconds or more every time the Mac is restarted and every time a different user logs onto the Mac. Finally, the review did not mention that limiting access to folders or applications with A.M.E. prevents backup programs, such as Dantz Development Corp.'s Retrospect Remote and network installation programs, such as ON Technology Inc.'s Status*Mac or Technology Works Inc.'s GraceLAN, from working — although A.M.E. isn't the only security product with this limitation.

Network administrators should recognize that securing individual Macs also makes network scanning, backing up and installations impossible. Perhaps one or more of the software developers in these areas will get their applications to work

together sometime in the future, but right now, you have to choose one or the other.

*Eric Jacobs, general manager
The Daily Pennsylvanian
Philadelphia*

Focusing on differences in Tempo macro utility

Thanks for your lengthy review of our flagship macro utility, Tempo II Plus 3.0 (MacWEEK, May 3). On the whole it was an excellent review, but there were a few observations that were incorrect or perhaps overlooked.

▶ Tempo can select the Hide or Show items from the System 7 Application menu. The screen shot you included shows this. That macro quits all open applications, in part by selecting Finder, then Hide Finder from the Application menu. It then tests to see if only the Finder remains and if not, selects Quit from the File menu and repeats the macro.

▶ The menu bar redraws only when Tempo converts the application's private clipboard to the Mac Clipboard to make a conditional comparison, not every time Tempo plays an external macro.

▶ If you record a drag in a window, such as selecting files in a folder, that macro will perform properly when you move the window to another location, even if you move it almost entirely off screen. Incidentally, if you record dragging files from Folder A to Folder B, the macro replays properly even after you move Folder B to the opposite side of Folder A.

The point we strive to make is that Tempo and CE Software Inc.'s QuickKeys are excellent but different programs. If you rate Tempo on whether it's just like QuickKeys, Tempo will surely lose, just as if you rate QuickKeys on whether it's Tempo, QuickKeys will surely lose.

For example, while Tempo may, as you point out, have a simpler interface, it also has the depth to

automate complex routines, our particular forte. Tempo's ability to "test" for information in a file creates unique interactive macros — the contents of a file can tell a Tempo macro what to do next. Tempo can batch-process an unlimited number of files. And its ability to send and receive Apple events and perform conditional tests on an AEReply means Tempo can provide an essential — and unique — service to other scripting programs as well.

It is this understanding that we hope your readers, who may require such capabilities, would gather from your review.

*Richard H. Barron, president
Affinity Microsystems Ltd.
Boulder, Colo.*

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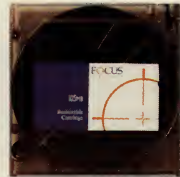
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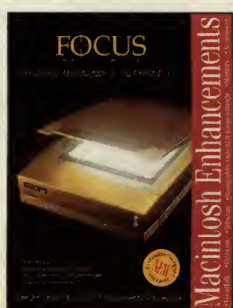


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Comparison

Nikon, Santos slide scanners focus on low cost, high quality

Both the Coolscan and the mira•35 models offer high-resolution scanning performance at an affordable price.

By Steve Hannaford

Two new high-resolution 35mm transparency scanners, both selling for less than \$2,700, have set new price and quality standards for that category. The Coolscan from Nikon Electronic Imaging (a division of Nikon Inc.) and the mira•35 from Santos Technology Inc. are compact machines that provide remarkably good scans at a low price.

Following the unrelenting trend in other hardware categories, these units have upped the ante in terms of value, design and software. Slide scanning add-ons to many flatbed scanners are the only competition in the price range, but such units offer low-resolution scans — most on the market top out at 600 dpi. The Nikon and Santos units offer high (2,700 dpi) resolution, which makes them even more useful for some serious color-scanning tasks. (A 35mm transparency needs a higher-resolution scan

than a standard reflective print since you're going to enlarge the image dramatically in most cases.)

This product category will not have universal appeal, however. No one would argue that either of these units matches in quality more expensive scanners from Nikon, Leaf Systems Inc. or other manufacturers. For example, we would not normally use the Coolscan or the mira•35 to scan images for display ads or magazine covers.

The Coolscan and the mira•35 can still fill a niche in the lower-end color desktop publishing, presentation and multimedia markets. The question of whether to buy one of these scanners is further complicated, however, by the availability of Eastman Kodak Co.'s Photo CD and the superior low-cost images it provides (see story, Page 78).

mira•35. Santos' mira•35, priced at \$2,695, is a dependable and fast desktop slide scanner, capable of scanning positive color or gray-scale slides at resolutions up to 2,700 dpi. The software driving the scanner is an Adobe Photoshop plug-in. A copy of Adobe Photoshop 2.5 is included in the package, as is a "lite" version of Photone International's Prepress color-correction software.

This scanner is a lightweight unit, weighing about 12 pounds, and has a small footprint (7 by 11 by 4.5 inches). It is relatively quiet, although the hum of a fan is noticeable, and it generates little heat. Setup of the mira•35 was generally very easy with the first two Macs we tried it with, but we had problems with a third Mac when we tried to insert it in the middle of the SCSI chain.

The mira•35's SCSI ID can be changed with a pen point on the unit. Software installation simply involves dragging the plug-in into the appropriate Photoshop folder. We were off and scanning in a few minutes.

Scanning software. As the slide is drawn into the mira•35 and scanned, the Mac screen displays an animation of the process. At the end of the sequence, the slide is ejected.

What is remarkable in the scanning software and hardware com-



The Adobe Photoshop plug-in for Santos Technology's mira•35 offers a wide set of controls for prescanning and manipulating the scan. While the controls are solid in general, there are some limitations. For instance, setting an output size and resolution can be tricky.

bination is its speed. According to Santos, the unit has a unique single-pass scanning mechanism. We found that we could scan a slide at 300 dpi in a 4-by-5-inch format in about three and a half minutes on an accelerated Mac IIci. Actual times depend on the available memory and disk space of the CPU. That's a good speed for any slide scanner, and speed proves to be the big advantage of this model.

The mira•35 documentation consists of an owner's manual, which includes installation instructions; a user's manual; and a very helpful and concise laminated reference card. The manuals are clearly laid out and informative,

able to scan to a particular resolution and final scanning size. For example, if we know we need a 3-by-4-inch final scan to print at 1,270 dpi, we should be able to enter those figures and have the computer figure out the normal scanning resolution. If we are working in Photoshop, we also expect to be able to open the file at the desired size and resolution. With the mira•35 software, no such provision is offered. We had to guess the required resolution, then resize the file in Photoshop. This is a major limitation of the Santos software.

We also had rotation problems. With a slide scanner, it's easy to insert the slide sideways or upside down. Ideally, your scanning software should let you correct such mistakes. While there are some controls for reversing the prescan, we found this had no effect on the final scan. We had to rotate the image in Photoshop — easy enough, but it would be simpler to do this in the scanning software.

Unlike the Nikon Coolscan and other higher-end film scanners, the mira•35 won't handle negative filmstrips. Given that the fastest turnaround you can get on film processing is with one-hour prints, for quick turnaround work this omission puts the mira•35 at a disadvantage, compared with flatbed scanners costing half as much.

These annoyances negate some of the advantage gained from the unit's scanning speed. On the whole, however, the mira•35 is a very competent, well-designed, well-packaged scanner, capable of producing good-quality images.

Nikon Coolscan. The Nikon Coolscan can scan at very high resolution, and it handles positive and negative 35mm film (mounted and unmounted). The scanner is offered both in an external configuration and an internal model — it

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score card

Low-cost slide scanners

Two new low-cost slide scanners offer quick, medium-quality slide scanning for a comparatively low price. These are suitable for low-volume scanning needs, where scanning a few images a day is the norm. They are not, however, intended for display ads or magazine cover work, and while more convenient, they don't offer the image quality provided by Eastman Kodak Co.'s Photo CD process.

► **Coolscan** from Nikon Electronic Imaging may be at the bottom end of Nikon's product line of slide scanners, but it is an impressive value that is easy to use, scans positive and negative film, and features powerful software. It produces surprisingly good results, but the penalty for this is in its scanning speed. For those who need occasional, good-quality 35mm scans, the Coolscan is a very good choice.

► **mira•35** from Santos Technology Inc. is a good desktop slide scanner that is much faster than the Coolscan. You can get slide scans with the mira•35 that are comparable in quality to those from the Coolscan, although the mira•35 cannot scan negatives. Scanning is achieved through an Adobe Photoshop plug-in that does not quite live up to the promise of the hardware. Unlike the Coolscan, the mira•35 comes bundled with Adobe Photoshop 2.5, which improves its value for users without that package.

	Coolscan	mira•35
Overall value	◆◆◆◆	◆◆◆◆
Price	\$2,495*	\$2,695
Performance	◆◆◆◆	◆◆◆◆◆
Features	◆◆◆◆◆	◆◆◆◆◆
Compatibility	◆◆◆◆◆	◆◆◆◆◆
Configuration	◆◆◆◆◆	◆◆◆◆◆
Documentation/support	◆◆◆◆◆	◆◆◆◆◆

* External version; internal model, \$2,195.

Following the unrelenting trend in other hardware categories, these units have upped the ante in terms of value, design and software.

and the explanations are careful and accurate. Santos' telephone support is toll-free, and the representatives were courteous and knowledgeable.

We had to make adjustments to improve the quality of shadow areas, but in general we got very satisfactory results once we got the hang of the controls. Like many desktop scanners, we found that the colors were somewhat soft, but they were reasonably accurate. Our scans were greatly improved after we used Photoshop to apply some sharpening and selectively increased saturation.

Problems with mira•35. In scanning software, we expect to be

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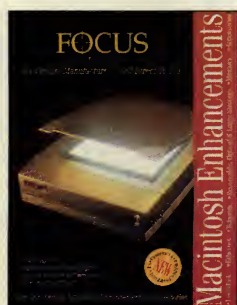
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The new Apple Workgroup Server 95



Scanners

From Page 74

can fit into the half-height drive bay on many of the newer Macs. The list price is \$2,495 for the external version and \$2,195 for the internal model. It has unusually powerful and efficient scanning software and seems to have very good optics for its price.

Nikon has touted its new solid-state technology in the Coolscan, which relies on red, green and blue LEDs to provide illumination instead of a standard light source and rotating filters used in other scanners.

The external version of the Coolscan we tested was simple to install. The SCSI ID can be easily changed on the back panel. We were impressed by the fact that the hardware installation took less than a minute, most of which involved clearing a space for the scanner on our crowded desk. Not that the Coolscan requires much room — its small dimensions (6 by 13 by 2 inches) and 4-pound weight make it both portable and adaptable.

Installing the Coolscan software is hardly more onerous than installing the hardware. We found it easy to extract the two software modules: a Photoshop plug-in and a small stand-alone application (unlike the mira•35, the Coolscan does not come with a version of Photoshop).

Also included is a curious little utility called Eject Coolscan Film, which, as its name implies, does one thing only — ejects a slide from the scanner. The slide, in fact, acts much like a Mac floppy disk — you cannot eject it mechanically; you must eject it via software. We learned this lesson the hard way when testing another scanner in parallel. We inadvertently left the test slide in the Nikon machine when we unchained it from the SCSI chain. We had to reattach the Coolscan scanner and turn it on to remove the slide by software — needle-nose pliers came to mind, but the manual strongly recommends

against such devices. Most users probably won't run into this problem, but using this eject program is a somewhat clunky way out of the predicament. An eject button would be appreciated.

Along with its compact size and clean lines, the Coolscan boasts a good internal design. Its operation is completely silent, and even after running for more than 24 hours, it produces virtually no heat — hence its name. We wish our other peripherals were as unobtrusive, and we applaud Nikon for the well-considered design of the Coolscan.

Controls. The Coolscan software, both in the Photoshop plug-in and stand-alone versions, has an ample set of preview and prescan controls, better than any we've seen on a low-cost scanner. While the defaults are sufficient to guarantee decent results for a novice, the scanner has enough features to let an experienced scanner operator bring in very good scans. Using (and experimenting with) the controls for a while allowed us to produce very high-quality results.

The scanner determines the best exposure and makes an attempt at auto-focus. You can adjust either the exposure or the focus controls on your own with simple sliders. A manual-focus knob is available on the unit as well, if you prefer.

On a complex level, the scanner software has elaborate controls for setting black point, white point and gamma, as well as for adjusting the three color channels. Setting the white point and black point of the image, which is needed to adjust a tonal-range distribution, is very well-designed. Both digital densitometer readings and a moving position in the tonal range curve indicate the values of the current pixel. A histogram of the distribution of tonal levels is available at all times to guide you in your choices. Having these controls in the prescan software lets you finely tune the level of information

before the final scan, which is a big plus in Nikon's favor.

The program gives you complete control over gamma curves, which can be altered, stored and loaded when you need them. The effect of the gamma curves can be viewed interactively, as can any changes to the individual color channels.

Unlike the mira•35, the Coolscan software allows you to easily determine the output file size, and proportions can be locked. You can determine both the output and input resolution of the scan. The input-resolution factor (called scan pitch) was somewhat obtusely described in the otherwise clear manual. Even a helpful technical representative at Nikon couldn't define the concept precisely.

We found that negative color film was as easy to scan as positive. (A film mount for unmounted negative strips is provided.) Software controls do the conversion automatically once you designate a negative.

While all of the controls can be a little intimidating, the Coolscan's help feature is an improvement over balloon help. If you turn the feature on, help text describing the function of each tool appears in an out-of-the-way message bar.

Scanning the results. The scans we made with the Coolscan were of very good quality for editorial production work and other



In addition to the normal controls, the software for Nikon's Coolscan offers elaborate focus and exposure adjustments. Scans can be adjusted by output size and resolution.

formats that can get by with low-resolution images. Given the formula of doubling your line screen to determine image resolution, the Coolscan, like the mira•35, is suitable for producing a 4-by-5-inch separation at 133 lines per inch.

Image quality of test scans with the Coolscan was very good, and using the scanner software, you can improve the images even further. We found no color cast, and the detail was good, even in complex shadow areas. The scans are quite true to the original colors. The output we got was more than adequate for most low-profile uses and better than the results we've seen from many flatbed scanners.

Documentation. The manual is generally excellent. Nikon

went out of its way to document carefully how to use this machine, and there are plenty of very good general tips for slide scanning. For example, several pages discuss the effect that the thickness of the slide mount can have on the focus, especially on high-resolution scans, and how to adjust for such cases. (According to Santos, the mira•35 automatically compensates for mount thickness differences.) Nikon also includes detailed discussion about how to tell the emulsion side from the base side of a slide, how to clean film and how to compensate for buckled slides. Complex concepts like the gamma curve and the focus adjustment are carefully described with good illustrations.

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The Coolscan software gives a remarkable range of gamma controls. The curves for each primary can be adjusted in detail, and histograms are available for reference.

Scanner users pause for Kodak moment

With the help of Tom Bromley at Centre Grafik, a service bureau in Wayne, Pa., we tested the output quality of Santos Technology Inc.'s mira•35 and Nikon Electronic Imaging's Coolscan against the Photo CD imaging system from Eastman Kodak Co.

Photo CD is Kodak's system for providing film and slide scanning for the mass market. For a few dollars per image, depending on the services provided, you can have existing film and slides scanned at very high resolution and returned in the form of a CD-ROM ready for use in a Photo CD-compatible drive.

The test image we used had vivid, saturated primary colors and a wide range of shadow details. Overall, it was somewhat more difficult than the average scan but still within the reasonable range.

We did a minimal amount of post-scan adjustment with the software provided by the mira•35 and the Coolscan. We mainly adjusted the gamma curve prescan to bring up the midtones and three-quarter tones, aiming to brighten the colors and bring out shadow details.

The Photo CD scan was done overnight by a commercial film lab, Filmet of Pittsburgh. We gave the lab no special instructions. We acquired the image from the Photo CD into Adobe Photoshop using Adobe Systems Inc.'s Photo CD plug-in filter.

We sharpened all three images once with Photoshop's Unsharp Mask filter. We separated the images in Photoshop, output them to film (about 4 by 5 inches, at 300 dpi with a 133-line-per-inch screen) on a Linotype-Hell L330 and created Matchprints to compare the results.

With the Photo CD image, we got quick turnaround and better results than from the other scanners; the image was sharper, with a wider dynamic range, and there was less need to do color correction. We must note, however, that we've talked to other users in the publishing industry who have said that Photo CD results can be uneven, depending on who is doing the work. The bargain-rate scanning, in particular, has led to inconsistent results.

Photo CD produced images a cut above both of the low-cost slide scanners. They were better in terms of clarity, brightness and detail.

Our cost per scan for the Photo CD was \$4, which does not include the \$700 or so for a Photo CD-compatible drive.

Scans are available for Photo CD users for as low as 80 cents per image, although scanning mounted slides costs more than scanning film in rolls because the slides are more labor-intensive.

All of the Photo CD images were suitable for a wide range of publication and nonpublication work, such as editorial photographs, output at moderate size (4 by 5 inches or less at 133 lines per inch or less), and presentation or multimedia work — in other words, the same kind of uses that the mira•35 and Coolscan scanners handle.

Fashion photography, cover shots and display ads will probably require more powerful and precise imaging solutions than can be provided with Photo CD, the mira•35 or the Coolscan. — By Steve Hannaford

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Scanners

From Page 78

The installation manual is almost too detailed, with much discussion of the oddities of the SCSI chain. In fact, using it on several different machines, we never ran into any SCSI problems with the Coolscan.

Toll-free technical support is available, and we received an immediate response to our questions from a helpful, intelligent employee.

Shortcomings. One thing you do sacrifice for the price and utility of the Coolscan is speed. We found that the same 300-dpi, 4-by-5-inch scans that took three and a half minutes with the mira•35 took almost seven minutes with the Coolscan, even with a relatively fast CPU and plenty of memory and disk storage. Given the chance that you may, as we did, want to rescan a few times, this is not a machine geared toward volume production. The

slowness may be a big problem if you do more than a few scans per day or if you have to go through dozens of scans at a sitting.

Conclusions. Our basic observation is that we got fairly comparable results from the two desktop scanners. The colors were good but a little muted. The Nikon scan was somewhat sharper and had a little more detail, although it also had a slight bluish cast.

But since the Photo CD is equal or better,

why get a desktop slide scanner? We can see several markets. Those who need quicker turnaround than Photo CD can deliver will want a scanner on their desks, as will those who scan only two or three slides per day. We can imagine small newspapers and magazines or newsletter publishers using this technology. And these scanners, especially when coupled with an inexpensive flatbed scanner, may be of great use in multimedia, where images are occasionally handled. Granted, we're describing niches in the market, but both scanners make sense for those who find themselves in such a category.

The Nikon Coolscan is a nice piece of work — a very good personal film scanner at a reasonable price. In terms of the functionality of the software and the ergonomic

The Nikon Coolscan is a nice piece of work — a very good personal film scanner at a reasonable price. In terms of the functionality of the software and the ergonomic simplicity of the hardware, it's a definite winner.

simplicity of the hardware, it's a definite winner. On the other hand, it is not a high-productivity scanner. It is well-suited for those who need to do a few scans a day and who need to scan only 35mm negative or transparency format. Also on the downside, it is not bundled with Photoshop.

The mira•35, which is a little more expensive, is not quite as polished. It lacks the Coolscan's ability to scan strip negatives, but the hardware features are comparable. The documentation and the scanning software, while satisfactory, don't quite measure up to the outstanding Nikon implementation. The speed advantages are significant if you're doing many scans, but we believe that time saved in scanning may be lost in making further post-scan adjustments in Photoshop. Improved software or a more competitive price might make this solid choice more of a contender with the tough competition from Nikon. □

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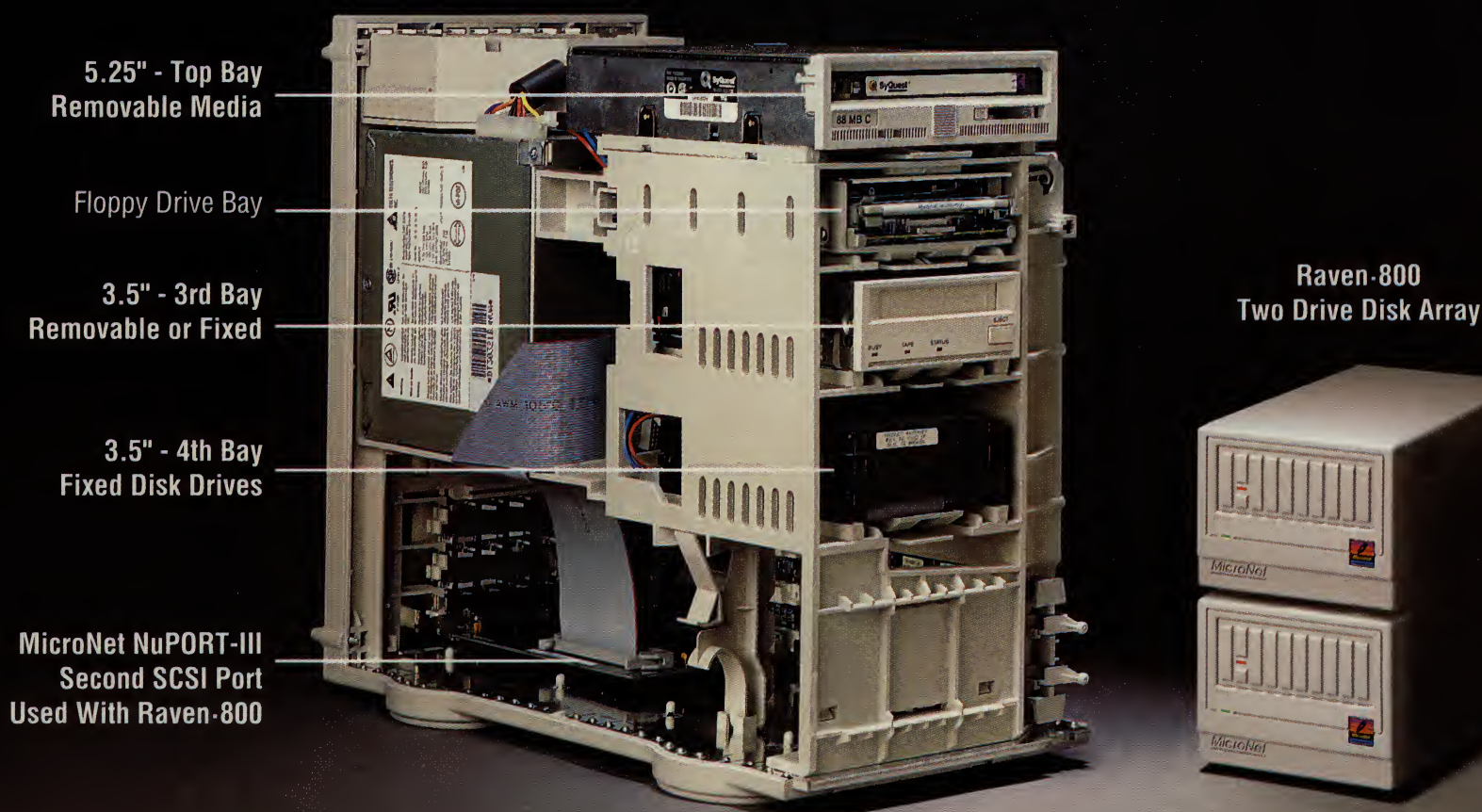
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Snapshot decisions: Finding the right Photo CD player

The ever-increasing array of CD-ROM drives with multisession capability means buyers can focus more on the options available.

By Mitzi Waltz

When the Kodak Photo CD player first became available for the Mac, most graphics professionals realized that it would be more than just another medium to store and view pictures.

Many users took a wait-and-see approach about the first units, which were single-session, for good reason. These devices could play only off-the-shelf products in Photo CD format, such as stock-photo collections or collections of in-house photographic images, digitized and mastered to disc in a single session.

The capability to add new images at will to the same disc (multisession) was key for users such as Brian Thomas of river-TEXT, a Portland, Ore.-based multimedia software firm. "I've been waiting for the multisession models to come out," Thomas said, noting that multisession-format capability will save him money on discs and make the technology more convenient to use.

Speed was also a major purchasing criteria, he said. "The new double-speed drives are supposed to be 60 percent to 70 percent faster at opening Photo CD images. And QuickTime compatibility, which is

basically a function of speed, is very important to me because I'm doing projects that include QuickTime movies and still images."

(Be aware, however, that manufacturers may advertise their drives as "QuickTime-compatible" without having them formally evaluated, according to Apple.)

Thomas said Photo CD offers him the capability to store hundreds of images in an easy-to-access format, without having to invest in expensive digital cameras or other equipment. Instead, he can shoot photos and have them digitally mastered to disc inexpensively and quickly at a local photography studio.

Getting in focus. If your company is planning a Photo CD purchase, you may have already discovered that there is a glut of choices available.

Keep in mind some guidelines that can help narrow down the ever-expanding field:

► Single-session drives, while still available from a few vendors, are basically obsolete. Existing drives based on Toshiba America Information Systems Inc.'s XM3300 series can be upgraded to handle multisession discs (see



JEFF QUAN

story below), but with comparable prices on some new multisession drives, there isn't a good reason to invest in a series that first needs to be upgraded.

► Access and transfer times are the most important characteristics for comparison of drives. Both figures will be expressed as averages in product literature and advertisements, so be aware that actual speeds may vary according to conditions of use. Most quality, multisession drives use dual-speed technology, allowing them to handle a variety of media, including Photo CD discs, data CDs and audio CDs.

► Higher-priced drives may include valuable bundled software or premastered disks; be sure to check with vendors before excluding models based on cost alone.

► Photo CD drives are read-

only; adding images to a multisession disc is accomplished with other write-capable equipment.

Although Eastman Kodak Co. developed the technology and software for Photo CD, it does not market a line of players, concentrating instead on mastering systems. Its Photo CD partner, Philips Consumer Electronics Co., recently announced its first Mac-compatible drives. The CM425ABK, an external model, and CM405ABK, an internal drive for the IIfx, Centris and Quadra, will feature access times of 265 milliseconds and data transfer rates of 300 Kbytes per second.

Toshiba is by far the dominant vendor in this field. Its mechanisms are resold by several other vendors, including CD Technology Inc., which is also responsible for the CD Porta Drive; Liberty Systems

See CD-ROM, next page

The power of multisession CDs is that they allow users to add new images at will and as needed, much like adding data to a floppy. However, special write-enabling equipment is needed in addition to the CD player.

Protect an old investment by upgrading your single-session Photo CD drive

For all you new-technology fiends who ran right out to buy the very first Photo CD drive you could get your hands on, the bad news is you purchased too early. The good news is that you may not be stuck with an obsolete single-session drive after all.

If your drive is based on the XM3300 series mechanism from Toshiba America Information Systems Inc., it can be upgraded to multisession capability for a very reasonable price. Toshiba has implemented a program that handles upgrades to drives sent in by its OEMs or customers.

Those who purchased a single-session Toshiba Photo CD drive sold under another company's brand name, such as drives marketed by Optical Access International Inc., may want to contact that vendor first.

OEMs may also need to update your software; for example, Optical Access adds a new version of its SuperCache pro-

gram to newly upgraded drives, which further enhances their performance. As a result, its upgrades also cost \$49 more, according to President Bill Rice.

The process of dealing directly with Toshiba is a bit more convoluted. Drive owners must first obtain a return authorization number from Toshiba, said Karen Allen, the company's public-relations representative.

The easiest method is to fax in your request on a special Photo CD upgrade fax form, she said. This form can be obtained by either calling Toshiba's service administration department at (714) 583-3129 or faxing a request for the form to (714) 583-3121. Upon receipt of the form, owners should fill it out and mail or fax it back to the manufacturer. Toshiba will send a return authorization number within 24 hours of receiving the completed form.

Once you have this magic number, you can mail your drive to Toshiba, along with an upgrade fee of \$99.

The company asks that the drive, which contains delicate components, be mailed in either its original carton or packaging of equal durability.

The return authorization number must be visible on the outside of the package to ensure proper routing. Once your drive is received, Toshiba will perform the upgrade and return it to you within seven working days, Allen said, unless additional repairs are needed.

If the drive needs more than just an upgrade or has been damaged in transit, the company will charge no more than \$175 more than the upgrade price to complete necessary repairs, Allen said, although it may be as long as 16 working days before you'll see your Photo CD drive

again if additional labor is required.

Performing the upgrade from single session to multisession requires changing the drive's internal instructions, or firmware, and is itself a relatively quick process, according to Toshiba.

Upgrading has proved quite popular with early Photo CD drive buyers, said Optical Access' Rice, probably because it's an inexpensive way to keep an otherwise less useful piece of hardware working for years. "We upgrade the original Allegro, which was single-session-capable, to multisession all the time," Rice said.

Owners of InterSect CDR-74 and CDR-38 CD drives from NEC Technologies Inc. can also upgrade. NEC is offering a trade-in program to exchange those drives for new Multispin 74 and Multispin 38 Photo CD drives. The swap costs \$229 or \$179, depending on the model being returned. Customers can contact NEC for more information. — By Mitzi Waltz

CD-ROM

From previous page

Inc., maker of the 115CD; and Optical Access International Inc., producer of the CD/Allegro II.

Both Toshiba and Sony Computer Peripheral Products Co., which reportedly supply the mechanisms for Apple's Photo CD drives, sell their own drives in Mac configurations as well as license them to others. Toshiba's external TXM-3401E and internal CD-ROM XM-3401B are multisession drives with moderate access times and, according to the company, extra attention paid to packaging, which keeps the drive environment cleaner and working longer.

Sony's CDU-561, a double-speed, multisession drive, accesses data at a fast 290 milliseconds with a data transfer rate of 300 Kbytes per second.

Apple's Photo CD shoot.

With a projected price of less than \$500 (including a pair of high-quality Mac speakers), Apple's recently announced PowerCD will play conventional data CDs, Photo CD discs and audio CDs, making it a dynamic multimedia powerhouse with appeal for both corporate and home Mac users. The PowerCD is slated to ship this summer.

In the meantime, Apple offers both external and internal Photo CD-compatible drives in its CD300 and CD300i models.

FWB Inc. boasts that its dual-speed hammerCD can operate at speeds as much as 1,000 percent faster than normal with its bundled CD-ROM ToolKit, a software package that caches CD information to RAM or a hard drive. The package is also sold separately and will work with drives from other manufacturers and provide Photo CD capability to drives previously without it.

PLI offers the PLI CD-ROM MS, a dual-speed CD-ROM drive with audio, data and multisession Photo CD capabilities. Available in an external or internal model, each features a convenient, user-controllable external SCSI termination switch.

Other Photo CD vendors include NEC Technologies Inc., whose Multispin 74 and portable Multispin 38 offer high-quality proprietary mechanisms at lower prices than some competitive models, and Texel America, which sells both internal and external drives with average access times of 265 milliseconds and data transfer rates of 300 Kbytes per second. Other products include the Mac-CD-LX and Mac-CD-MX from Procom Technology Inc., the CDA-435 and CDA-535 from Chinon America Inc., and the Micro/CD-ROM from MicroNet Technology Inc.

Big bundles. One noticeably growing trend is "kitchen sink" hardware-software bundles offered in the marketing of Photo CD drives. Texel, for example, offers business, home, education and multimedia bundles in both internal and external configurations. These collections include a Photo CD drive, speakers, headphones, audio-control software (which allows the drive to play audio CDs), and a selection of CDs and software.

SuperMac Technology Inc. recently released two Photo CD bundles, PhotoSpeed and PhotoSpeed Pro, that combine a Toshiba TXM-3401E multisession CD-ROM drive with NuBus graphics cards and oodles of image access, retrieval, storage and content software. The software includes Kodak's Photo CD Access, Adobe Photoshop, Storm Technology Inc.'s PicturePress and Color Byte's Stock Photos. SuperMac said that, combined, the card and software can speed graphics applications by as much as 2,300 percent.

Procom Technology and a few other companies also offer bundle options with more of a home-entertainment slant, adding speakers, audio control, games and reference works to multisession drives.

Apple itself may soon join the bundling game. Developers are being briefed about a program the company calls Software Access Initiative, which would bundle Photo CD-compatible drives with Apple-produced CDs containing promotional items, program demos and encrypted software, for which buyers could obtain "keys" from Apple at lower-than-retail prices. The initiative is slated for a third-quarter launch.

Jukeboxes: When you're having more than one. For users with large image libraries to keep on-line, Pioneer New Media Technologies Inc. and Optical Access International now market multisession-compatible Photo CD jukebox drives for the Mac.

Both can handle six CDs at once, providing about 3.3 Gbytes of revolving image storage with speedy access times. Pioneer's DRM-604X offers a blazing data transfer rate of 614 Kbytes per second, closely matched by the 600-Kbytes per second speed of Optical Access' Turbo Sixpack.

Another possibility for those with serious storage needs is Texel's four- and seven-drive CD-ROM towers. Optical Access International also markets a pair of four-drive towers, the Access Quartet A and Access Quartet B.

These high-volume drives might be particularly appropriate for catalog producers and other publishers,

as well as for any business's text storage and retrieval.

Buying advice. Macintosh users should know that computer-compatible Photo CD drives do not have the capability to also work with a TV monitor, as do some consumer models. The latter include on-board circuitry to run the monitor.

Some users contacted by MacWEEK expressed a strong interest in portable, dual-capability (TV/computer) players, which might be particularly handy for presentations or trade-show displays.

Several drive makers advertise their compliance with the evolving Multimedia PC standard, a criteria that may be important to some multimedia developers and to those work-

ing in multiplatform environments.

For buyers still overwhelmed by the flood of selections, Kodak offers help for consumers via a toll-free information line at (800) 242-2424, Ext. 53. Callers can ask about recommended memory configurations for their Macs, get a list of Photo CD players that have been tested and approved by Kodak, and request printed information on the technology.

Beyond that, it's a matter of compare and contrast based on those features most important to your company and the task at hand. Luckily for buyers, prices seem to be landing at a reasonable level, with access times, transfer speeds and cache sizes nearing some level of standardization. □

See Product Info, Page 86

The big picture on Photo CD drives

VENDOR/PRODUCT	PRICE	ACCESS TIME (IN MS)	TRANSFER SPEED (IN KBPS)	BUFFER SIZE	WARRANTY IN YEARS
Apple PowerCD	Less than \$500	Unknown	Unknown	256	Not available
Apple CD300	\$599 (external)	295	300	256	1
Apple CD300i	Not yet available	295	300	256	1
CD Technology CD PortaDrive 3401	\$850 (ext.), \$700 (int.)	200	330	256	1, labor; 2, parts
Chinon America CDA-535	\$795	280	150	256	1
Chinon America CDA-435*	\$645	350	150	64	1
FWB hammerCD	\$959	200	330	256	1
Liberty Systems 115CD	\$699	200	330	256	1
MicroNet Technology Micro/CD-ROM	\$995 (ext.), \$895 (int.)	225	215	256	1
NEC Technologies Multispin 74	\$615	280	300	256	2
NEC Technologies Multispin 38	\$465	400	300	64	2
Optical Access CD/Allegro II	\$648	180	330	256	1
Optical Access Turbo Sixpack	\$1,595	300	600	256	1
Optical Access Access CD Quartet A	\$2,595	190	330	256	1
Optical Access Access CD Quartet B	\$2,395	265	306	256	1
Optical Access Performer II	\$479	270	312	256	1
Philips Consumer Elec. CM405ABK	\$599 (internal)	265	300	64	1
Philips Consumer Elec. CM425ABK	\$699 (external)	265	300	64	1
Pioneer New Media DRM-604X	\$1,845	300	614	128	1
Pioneer New Media DRM-600A *	\$1,250	800	150	64	1
PLI PLI CD-ROM MS	\$969 (ext.), \$843 (int.)	200	330	256	1
Procom Technology Mac-CD-MX	\$795 to \$995	200	330	256	1
Procom Technology Mac-CD-LX *	\$595 to \$845	380	150	64	1
Sony Computer Peripheral CDU-561	\$648	290	300	256	1
SuperMac Technology PhotoSpeed	\$3,999	200	330	256	1
SuperMac Technology PhotoSpeed Pro	\$4,999	200	330	256	1
Texel America DM3024	\$499 (internal)	265	300	64	1
Texel America DM5024	\$599 (external)	265	300	64	1
Texel America 4-drive tower	\$2,334	265	300	64	1
Texel America 7-drive tower	\$3,967	265	300	64	1
Toshiba America TXM-3401E	\$895 (external)	200	330	256	1
Toshiba America CD-ROM XM-3401B	\$695 (internal)	200	330	256	1

* All products are multisession except those marked with an asterisk.

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Product Info

APPLE

PowerCD: less than \$500; **CD300:** \$599 (external); **CD300i:** pricing not available
20525 Mariani Ave., Cupertino, Calif. 95014
Phone (408) 996-1010 or (800) 776-2333

CD TECHNOLOGY INC.

CD Porta Drive 3401: \$700 (internal),
\$850 (external)

766 San Aleso, Sunnyvale, Calif. 94086
Phone (408) 752-8500; fax (408) 752-8501

CHINON AMERICA INC., INFORMATION SERVICES

CDA-435: \$645; **CDA-535:** \$795
615 Hawaii Ave., Torrance, Calif. 90503-9747
Phone (310) 533-0274 or (800) 441-0222;
fax (310) 533-1727

FWB INC.

CD-ROM ToolKit: \$79; **hammerCD:** \$959

2040 Polk St., Suite 215, San Francisco,
Calif. 94109
Phone (415) 474-8055; fax (415) 775-2125

LIBERTY SYSTEMS INC.

115CD: \$699
160 Saratoga Ave., Suite 38, Santa Clara, Calif. 95051
Phone (408) 983-1127; fax (408) 243-2885

MICRONET TECHNOLOGY INC.

Micro/CD-ROM: \$895 (internal),

\$995 (external)
20 Mason, Irvine, Calif. 92718
Phone (714) 837-6033;
fax (714) 837-1164

NEC TECHNOLOGIES INC.

Multispin 38: \$465; **Multispin 74:** \$615
1255 Michael Drive, Wood Dale, Ill. 60191
Phone (708) 860-9500 or (800) 388-8888;
fax (800) 366-0476

OPTICAL ACCESS INTERNATIONAL INC.

Performer II: \$479; **CD/Allegro II:** \$648;
Turbo Sixpack: \$1,595; **Access Quartet A:**
\$2,595; **Access Quartet B:** \$2,395
800 W. Cummings Park, Suite 2050, Woburn,
Mass. 01801
Phone (617) 937-3910 or (800) 433-5133;
fax (617) 937-3950

PHILIPS CONSUMER ELECTRONICS CO.

CM405ABK: \$599 (internal);
CM425ABK: \$699 (external)
1 Philips Drive, P.O. Box 14810, Knoxville,
Tenn. 37914-1810
Phone (615) 521-4316 or (800) 835-3506;
fax (615) 475-0387

PIONEER NEW MEDIA TECHNOLOGIES INC.

DRM-600A: \$1,250; **DRM-604X:** \$1,845
2265 E. 220th St., Long Beach, Calif. 90810
Phone (617) 542-6290

PLI

PLI CD-ROM MS: \$843 (internal),
\$969 (external)
47421 Bayside Parkway, Fremont, Calif. 94538
Phone (510) 657-2211 or (800) 288-8754;
fax (510) 683-9713

PROCOM TECHNOLOGY INC.

Mac-CD-LX: \$595; **Mac-CD-MX:** \$795;
Mac-CD-LX Station: \$845 (with headphones,
speakers and seven CDs);
Mac-CD Station 2: \$995 (with headphones,
speakers and seven CDs)
2181 Dupont Drive, Irvine, Calif. 92715
Phone (714) 852-1000 or (800) 800-8600;
fax (714) 852-1221

SONY COMPUTER PERIPHERAL PRODUCTS CO.

CDU-561: \$648
655 River Oaks Parkway, San Jose, Calif. 95134
Phone (408) 432-0190 or (800) 352-7669

SUPERMAC TECHNOLOGY INC.

PhotoSpeed: \$3,999; **PhotoSpeed Pro:** \$4,999
485 Potrero Ave., Sunnyvale, Calif. 94086
Phone (408) 245-2202 or (800) 334-3005;
fax (408) 735-7250 or (800) 541-7680

TEXEL AMERICA

DM3024: \$499 (internal); **DM5024:**
\$599 (external); **Mac bundle:** \$899;
four-drive tower: \$2,334;
seven-drive tower: \$3,967
1605 Wyatt Drive, Santa Clara, Calif. 95054
Phone (408) 980-1838 or (800) 886-3935;
fax (408) 980-1840

TOSHIBA AMERICA INFORMATION SYSTEMS INC.

Toshiba CD-ROM XM-3401B: \$695 (internal);
Toshiba TXM-3401E: \$895 (external), plus
\$115 for cable kit
9740 Irvine Blvd., Irvine, Calif. 92713
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PRODUCT DEMO

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MacWEEK readers are busy. Sure, you always make time to see the latest products at the industry shows, but it's exhausting to wade through the crowds. It takes too much time searching for someone who can answer important questions about product features, system requirements, service availability, pricing.

Or, there is MacWEEK's annual MVB event in Boston. The MVB show is designed to give a limited

number of MacWEEK readers the opportunity to get a close look at the latest products for the Macintosh. The most innovative Macintosh vendors will be there to demonstrate products and answer questions.

The MacWEEK MVB event will be held in Boston on August 2nd, the day before the Macworld show. The product exhibition hours are 1:30 to 4 pm, all guests are eligible for our product drawing.

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MacInTouch RIC FORD

Checking ins and outs of QuickTime audio

QuickTime 1.6 and Sound Manager 3.0 are about to change the Mac's audio tune in distinct ways. Extra third-party pieces are also needed.

BUGS & TIPS

Making strides. QuickTime has some limitations, but it ranks as one of Apple's most significant recent achievements.

Like AppleTalk Remote Access (ARA), QuickTime expands the boundaries of Macintosh computing and gives the company real competitive advantages.

Developers, spurred by QuickTime's widespread availability and nominal cost, are using it as a basis for many applications. (By contrast, ARA's \$199 price tag limits its growth.)

As we wait for the pricing and delivery of other architectural developments — QuickDraw GX and AOCE (Apple Open Collaboration Environment) — QuickTime is here today and already growing in

response to the real-world needs of customers and developers.

A new release, QuickTime 1.6, should be available about the time this column reaches print, through on-line information services, direct from Apple on floppy disk and bundled with system software (see MacWEEK, April 26).

Among many bug fixes and improvements, some of the most interesting changes involve audio.

Building bridges. The combination of QuickTime 1.6 and Apple's latest CD-ROM drives has broken down a fence between the world of sounds recorded on audio CDs and the world of Macintosh sound.

With QuickTime 1.6 installed, you can open the soundtracks of an audio CD from any application that opens QuickTime movies. A Con-

vert button in the Open dialog saves the digital audio into a new QuickTime movie. You specify the movie's sound quality (from eight-bit, 11-kHz monophonic samples to full CD-quality stereo).

This feature extends a capability introduced in QuickTime 1.5, which converts PICS and AIFF (Audio Interchange File Format) files to movies in a similar manner.

These conversion routines work differently from the translation of Photo CD files to Mac formats (see MacWEEK, Jan. 4). Foreign File Access is not involved, and dragging an icon from an audio CD to a Macintosh volume does not capture or convert the soundtrack.

At the moment, importing audio CD tracks works only with AppleCD 300 drives and only with the latest Apple CD-ROM software.

Storage vendor FWB Inc. plans to add the capability in a future version of its CD-ROM ToolKit package, but company engineers said they know of only two CD-ROM drives with hardware support: Toshiba America Information Systems Inc.'s TXM-3401 and Sony Computer Peripheral Products Co.'s CDU-561, on which Apple's drive is based.

Getting out. Multimedia producers gain a simple, new method for obtaining top-quality sounds (assuming that copyright issues are manageable), but audio and video producers need to get high-quality audio back out of the Mac, too. This requires some additional pieces, which are not included within QuickTime 1.6.

The critical component is Apple's long-awaited Sound Manager update. Sound Manager 3.0 is due to follow QuickTime 1.6 out the door, but it will not be distributed directly to customers, according to Apple. Instead, third-party developers must license it for inclusion with their products, much like Macintosh Easy Open.

The new Sound Manager will finally break the eight-bit limitation on QuickTime movie playback, with a modular system for selecting among sound input and output devices with various capabilities.

Sound devices require their own extensions, in addition to the new Sound Manager extension and a new Sound control panel, which provides for choosing and configuring the input and output devices.

It could take a while for all these pieces to reach customers, and there may be compatibility issues to work out with existing software.

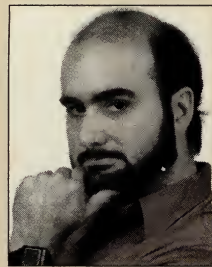
In return, Sound Manager 3.0 promises a small performance bonus by lessening the load on the CPU. This should improve movie playback by about one frame per second, according to beta documentation.

More important, though, is the

Ask David Ramsey

More monitor adjustments

Apparently there are a lot of folks out there who want to adjust their monitors; since I described how to adjust an Apple 16-inch monitor to reduce the generous black border around the image, I've been deluged with questions about performing the same adjustments on the new 14-inch monitor.



The controls you adjust are the same, but for some reason they're not accessible from the outside of the 14-inch monitor. They're under the blank plastic section between the power cord and video cable on the back of the monitor, and you must remove the rear of the case to get to them.

The usual caveats about torching your warranty and being cautious of the high voltages inside the case apply.

The monitor case is held on by two screws on the bottom, near the front of the monitor. Once they're removed, the only thing holding the case on is a friction fit between the rear section and the front bezel. Work the case loose gently and set it aside. The controls are visible at the lower rear center of the monitor and are identified by icons. Also visible is a mushroom-shaped rubber cap on the picture tube, with a thick rubber-insulated wire leading to a square box on the circuit board. The box is the fly-back transformer, and it generates a few tens of thousands of volts for the CRT.

Although it and the cable are insulated, you can shock yourself, so be careful and use the same plastic TV tuner tools recommended in the May 11 column.

Turn the monitor on and let it warm up for a few minutes, then adjust the image to your satisfaction. I've found that the 14-inch monitor often requires more tweaking than the 16-inch monitor; there's a separate control for adjusting pincushioning — the icon for the control looks like a square with its sides pressed in — which you may have to adjust if the sides of the monitor's image appear to be curved inward.

Q. Why doesn't Apple adjust the monitors at the factory?

A. It does. The black borders are wider because not all monitors can display sharp images at the edges of the tubes, and the extra hand adjustment required to tweak each monitor to its absolute best would be expensive.

Please send questions to David Ramsey on CompuServe: 76702,335 or to Ask David Ramsey, c/o MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105.


new modularity brought to the Mac's sound software, which should provide a more stable platform for the advanced audio capabilities of Apple's unannounced machines.

Other tidbits. A raft of other improvements in QuickTime 1.6 addresses various problems and limitations. A new dithering algorithm helps play movies at much more realistic speeds in four-bit gray scale, although it introduces some

halftone-like patterning to the image.

A new compressor-decompressor (codec) is also included in the release, using a YUV (component brightness and color) video model. This codec is supposed to maintain very high image quality at its 2-1 compression ratio. To access the codec, you need to use the Option key with the compressor pop-up menu in standard QuickTime applications. (This shows a complete list of all codecs.) □

Comments on MacInTouch are welcome at 7 Parmenter Ave., Maynard, Mass. 01754. Phone (508) 897-2621. Address electronic mail to RICFORD on AppleLink or MCI Mail; to 72511,44 on CompuServe; or on the Internet to 72511.44@compuserve.com. Join us on-line in the MacWEEK Forum at location ZMC:MACWEEK on CompuServe or ZiffNet/Mac.



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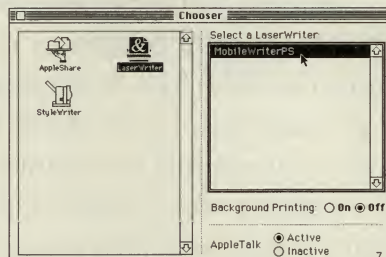


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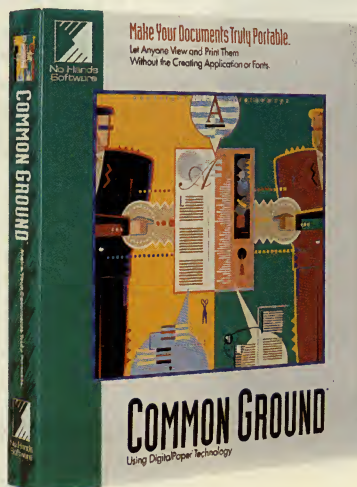
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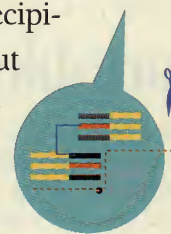
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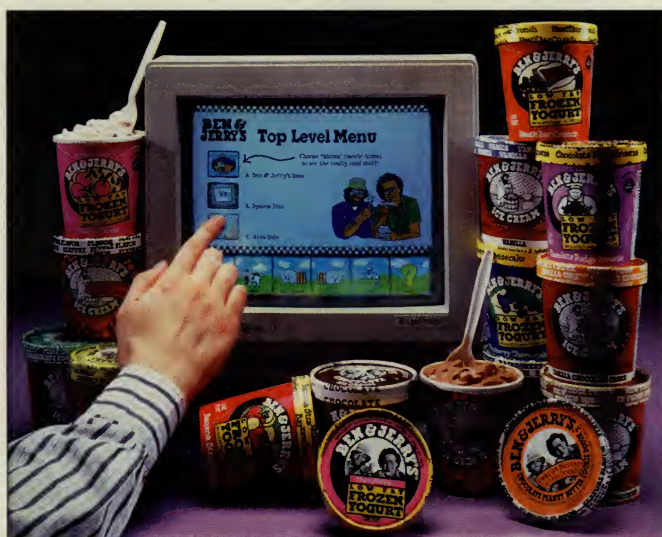
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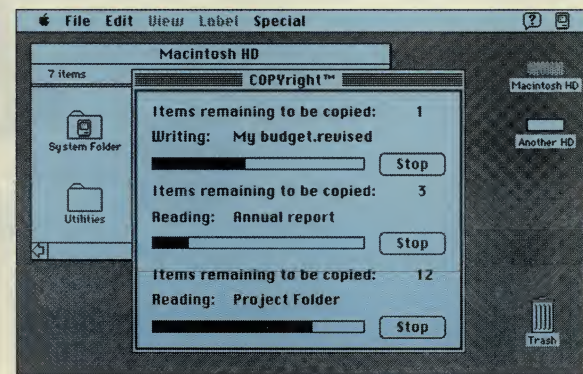
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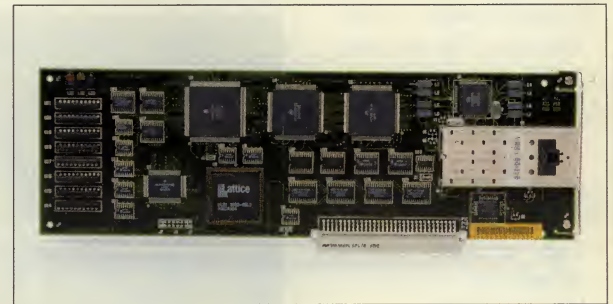
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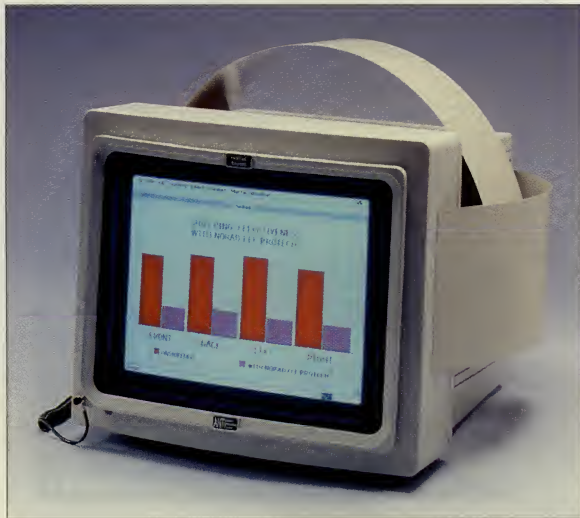
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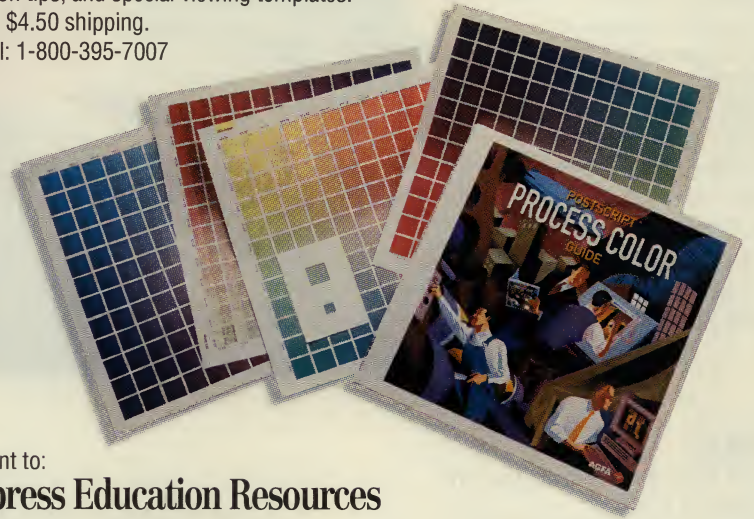
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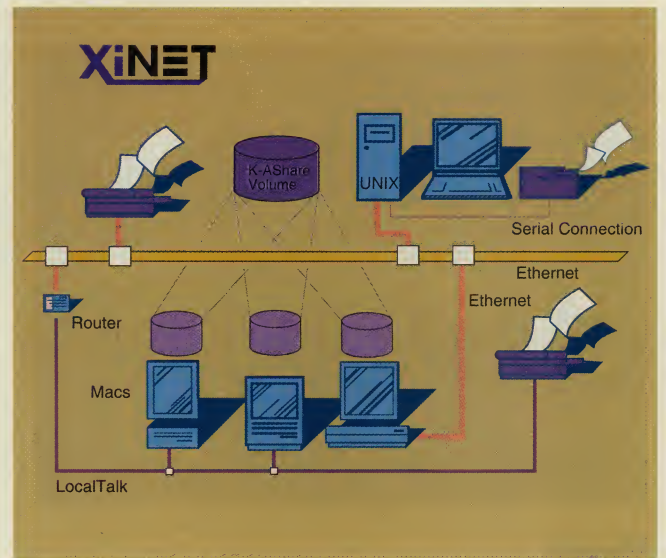
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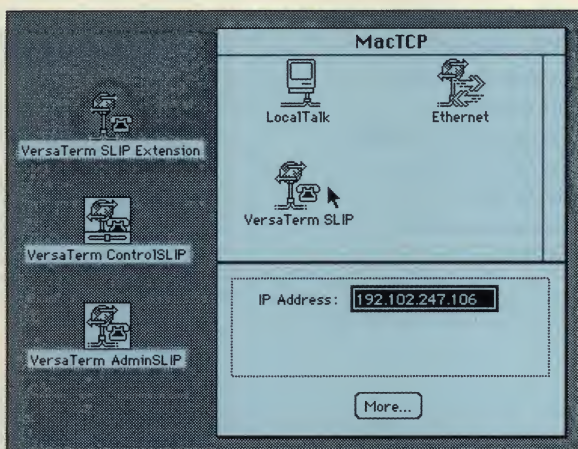
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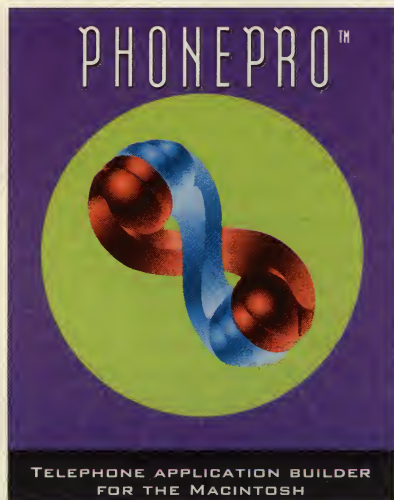
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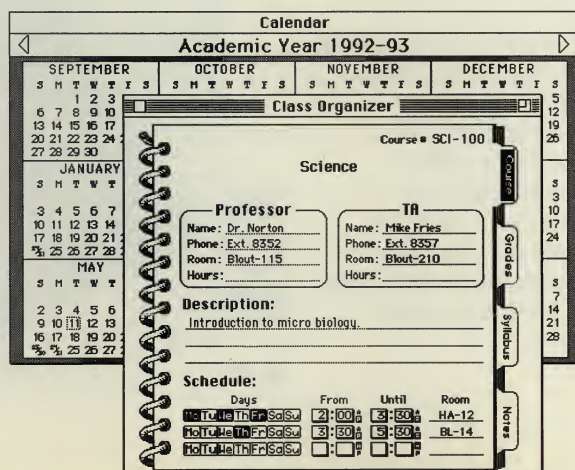
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- 6MB MODULE P/B 140; 145; 170
- 2MB MODULE POWERBOOK 100
- 4MB MODULE POWERBOOK 100
- 6MB MODULE POWERBOOK 100

DUO MEMORY

- DUO DOCK 210/230 4MB MODULE
- DUO DOCK 210/230 8MB MODULE
- DUO DOCK 210/230 14MB MODULE

New!

CENTRIS /LCIII

- New!* 1MB MODULE LCIII
- New!* 2MB MODULE LCIII
- New!* 4MB MODULE CENTRIS, LCIII
- New!* 8MB MODULE CENTRIS, LCIII
- New!* 16MB MODULE CENTRIS, LCIII
- New!* 32MB MODULE CENTRIS, LCIII

Standard SIMMs

- 1MBX8-70
- 1MBX8-80
- 2MBX8-80
- 2MBX8-70
- 4MBX8-80
- 4MBX8-70
- 4MB with PAL
- 8MB Standard
- 8MB Q700
- 16MB Standard
- 16MB Q-700

QUADRA 800

- New!* 4MB Q-800
- New!* 8MB Q-800
- New!* 16MB Q-800
- New!* 32MB Q-800

VX

- New!* 32MB VX Kit
- New!* 64MB VX Kit

FX

- 1MB IIfx-70
- 4MB IIfx-70
- 8MB IIfx-70
- 16MB IIfx-70

PORTABLE/BACKLIT

- 1MB Portable/Backlit
- through
- 7MB Portable/Backlit

ACCELERATOR SIMMs

- 16MB Credit Card

VRAM

- LC
- Centris
- Duo
- Quadra

G-WORLD SIMMs

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Need vast storage, 650 megabytes per cartridge? That's about 270,000 pages of text per disk. High speed data transfer and quick access. Fully ANSI standard, so, if you have other 600 or 650 megabyte cartridges, drop them in and be on your way.

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Performer II**

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Performance as it was meant to be, Double Speed, Multi-session Photo CD, QuickTime™ taken to the Max. Out performs every other single disc CD-ROM drive. 180 ms average access, 330 Kb/sec transfer.

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CD/6-Pak**

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If you have a Macintosh network and need to have multi-user access to multiple CD titles, this is your only solution. Four independently operating drives, with one simple cable connection to your file server. Heavy duty power supplies and shortened and simplified SCSI cabling ensures error free usage.

Product Name	Drive Type	Average Access	Sustained Transfer	Capacity	Price
CD/Allegro II	CD-ROM	180ms	330 Kb/Sec	680 Kb	\$648
CD/Performer II	CD-ROM	260ms	306 Kb/Sec	680 Kb	\$499
CD/Turbo 6-Pak	CD-ROM	290ms	612 Kb/Sec	4.08 Gb	\$1595
CD/6-Pak	CD-ROM	480ms	153 Kb/Sec	3.48 Gb	\$1095
CD/Quartet(A)	CD-ROM	180ms	330 Kb/Sec	2.72 Mb	\$2595
CD/Quartet(B)	CD-ROM	260ms	300 Kb/Sec	2.72 Mb	\$2395
RD/Aria	Erasable	37ms	768 Kb/Sec	128 Mb	\$1395
RD/128 LC	Erasable	55ms	640 Kb/Sec	128 Mb	\$999
RD/Express	Erasable	37ms	870 Kb/Sec	650 Mb	\$2495
MF/Gigabyte	Multi-Function	70ms	990 Kb/Sec	1000 Mb	\$2995

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Hard Drives

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Unformatted Capacity	Access Time	Internal	External
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85 mb LPS	17 ms	\$178	\$238
170 mb LPS	12 ms	\$248	\$298
212 mb LPS	9 ms	\$338	\$398
540 mb	8.5 ms	\$848	\$898

QUANTUM

ELS Series (3.5" Low Profile and Low Power Drives)			
85 mb	17 ms	\$189	\$248
127 mb	17 ms	\$228	\$288
170 mb	17 ms	\$249	\$309
LPS Series (3.5" Low Profile and Low Power Drives)			
240 mb	10 ms	\$328	\$389
525 mb	10 ms	\$859	\$918
Prodrive Series (3.5" Half Height Drives)			
1.0 Gig	10 ms	\$1209	\$1268
1.2 Gig	10 ms	\$1349	\$1408
GO•Drive 2.5" Hard Drive (All Quantums - 2 year Warranty)			
160 mb	17 ms	\$499	\$599

TOSHIBA

3.5" & 2.5" Disk Drives (2 year Warranty)			
2.5" 213 mb	12 ms	\$549	\$648
3.5" 830 mb	12 ms	\$1029	\$1089
3.5" 1.2 Gig	12 ms	\$1339	\$1389

FUJITSU

3.5" & 5.25" Disk Drives (5 year Warranty)			
3.5" 520 mb	9 ms	\$768	\$858
3.5" 1.1 Gig	8.5 ms	\$1498	\$1568
5.25" 1.2 Gig	11.5 ms	\$1178	\$1278
5.25" 2.06 Gig	11.5 ms	\$2098	\$2198
5.25" 2.4 Gig	11.5 ms	\$2298	\$2378

SEAGATE

3.5" Half Height Drives (1 and 5 year Warranties)			
1.2 Gig	10.5 ms	\$1128	\$1198
Wren and Elite Series (5.25" Full Height Drives)			
Wren 7 1.2 Gig	15 ms	\$1128	\$1228
Wren 8 1.6 Gig	15 ms	\$1328	\$1408
Wren 9 2.1 Gig	12.5 ms	\$1698	\$1788
Elite 1 1.6 Gig	11.5 ms	\$1798	\$1888
Elite 2 2.4 Gig	11 ms	\$2398	\$2488
Elite 3 3.4 Gig	11 ms	\$2998	\$3088

Media

Model	QTY	1 SPK	10PK	Model	QTY	1 SPK	10PK
SyQ44 cart	\$67	\$65	\$63	128mb OPT	\$39	\$37	\$35
SyQ 88 cart	\$107	\$104	\$99	256mb OPT	\$86	\$84	\$79
SyQ 105 cart	\$79	\$76	\$72	90mm DAT	\$19	\$17	\$14

Modems

PROMETHEUS

All units come with MacFAX & MacKnowledge Software	Price
Ultima Home Office	
ext 14.4/14.4SR Fax w/ V.42 bis & voice	\$398
Promodem 144i Internal for Powerbook	
14.4/14.4SR Fax w/ V.42 & V.42 bis	\$268
Promodem 144e	
ext 14.4/14.4 SR Fax w/ V.42 & V.42 bis	\$268
Promodem 24e ext 24/96SR Fax w/ V.42 & V.42 bis	\$128
Promodem Mini 2400 2400 BPS mini, data only	\$79

ZOOM TELEPHONICS

All units come with Microphone LT & STF FAX Software	Price
Faxmodem PBK for Internal Powerbook	
96/48 SR Fax w/2400 BPS Modem	\$99
Faxmodem PKT Portable	
96/48 SR Fax w/2400 BPS Modem	\$109
Faxmodem FXV	
V42 bis/MNP5/2400 BPS, 96/96 SR Fax	\$119
Faxmodem VFX V.32	
V.32 bis, 14.4 data & fax, V.42 bis/MNP5	\$239



CD ROMS



Toshiba 3401 Ext Drive \$498
 200ms, Multisession, DualSpeed, SCSI-II

Texel DM-3024 Ext Drive \$428
 265ms, Multisession, DualSpeed, SCSI-II

NEC Intersect Ext Drive \$169
 425ms, Single Session, Single Speed, SCSI-I

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- Font Fun House • Font Pro Vol. 1/The Essentials
- Publish It! 2.0 with Clip Art Fonts • Color it!

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UMAX

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Model	Price
UC630 - Color w/free Photoshop v2.5	\$1078
UC1200s - Color w/free Photoshop v2.5	\$2948
UC840 - Color w/free Photoshop v2.5	\$1248
Transparency Unit	\$698
Auto Document feeder	\$398
UG630 - Greyscale w/free Typereader	
OCR, OFOTO & Publish It	\$848

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DAYSTAR DIGITAL

Model	Without FPU	with FPU
33 MHZ Powercache	\$375	\$465
40 MHZ Powercache	\$545	\$635
50 MHZ Powercache	\$714	\$845
Powercache Adapter		\$40
Fast Cache Ilsi	\$279	\$349
Fast Cache Ilici		\$199
Fast Cache Quadra 700, 900		\$249
Fast Cache Quadra (all)		\$375
33 MHZ Turbo 040		\$1345
Fast Cache Turbo 33-128k		\$179
Charger for Photoshop		\$799

Optical & DAT Drives

Includes one free disc (1 year Warranty)

128 mb Panasonic Optical	39 ms	\$878
128 mb Epson Optical	29 ms	\$988
256 mb Most Optical	31 ms	\$1598
Unformatted Capacity W/Retrospect W/Retrospect Remote		
Includes free 90m Tape & Retrospect or Retrospect Remote software		
WangTek 2.1 Gig DAT	\$998	\$1198
WangDat 5.0 Gig DAT	\$1298	\$1498

SyQuest

Unformatted Capacity	Access Time	Price
Includes one free cartridge (2 year Warranty)		
44 mb External	19 ms	\$378
88C mb External	19 ms	\$568
105 mb External	14.5 ms	\$728

Memory

Model	60 NS	70 NS	80 NS	Model	60 NS	70 NS	80 NS
1x8	Call	\$37	Call	2x8	Call	\$66	Call
4x8	Call	\$137	Call	16x8	Call	\$555	Call
We carry most Mac Memory, Please Call for prices!							
Memory for LCIII, Centris 610, 650							
4mb	\$139			8mb	\$279		
				16mb	\$599		

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Model	Speed	Size	External
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128mb cartridges (Tosoh)			\$39

FUJITSU NEW!

Model	Speed	Size	External
128mb	30ms	3.5"TH	\$1049
128mb cartridges (Tosoh)			\$39

Maxtor

Model	Speed	Size	External
Tahiti IIM	35ms	1.0gb	\$3095
1.0gb Optical Glass Cartridge			\$225

All MO drives come with FWB™ HDT software, one MO cartridge and have a ONE year Warranty.

SHARP

Model	Speed	Size	External
650mb	40ms	3.5"HH	\$2145
650mb Cartridge			\$99

THE ONLY 5.25" HH 650MB OPTICAL ON THE MARKET!

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2.0gb DAT
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Model	External
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4.0gb - 8.0gb Compression Turbo	\$1399
90m/60m Tape	\$19/\$16

TEAC

Model	External
150mb Tape Backup Drive	\$489
600mb Tape Backup Drive	\$689
600mb / 150mb Tape Cassette	\$25/\$20

All tape backup drives come bundled with FREE Retrospect V.2.0, one tape and have a ONE year warranty.

CD-ROM DRIVES

TOSHIBA

Model	Speed	Size	External
600mb	200ms	3.5"HH	\$549

TEXEL NEW!

Model	Speed	Size	External
600mb	265ms	3.5"HH	\$499

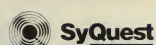
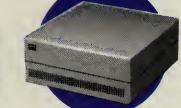
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Model

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External SyQuest 88mb C* (One Cartridge Inc.)	\$559
External SyQuest 105mb (One Cartridge Inc.)	\$699
Internal SyQuest 44mb (for Quadra 900 & 950)	\$355
Internal SyQuest 88mb (for Quadra 900 & 950)	\$455
Internal SyQuest 88mb C (for Quadra 900 & 950)	\$545
Internal SyQuest 105mb (One Cartridge Inc.)	\$669
External SyQuest Dual 44mb (One Cartridge Inc.)	\$695
External SyQuest Dual 88mb (One Cartridge Inc.)	\$875
External SyQuest Dual 44/88mb (One 44 & One 88 Cartridge)	\$875
External SyQuest Dual 88C mb (One Cartridge Inc.)	\$1045
External SyQuest Dual 44/88C mb (One 44 & One 88 Cartridge)	\$965
SyQuest 44mb Cartridge/10 Pack	\$62.50/\$610
SyQuest 88mb Cartridge/5 Pack	\$96.50/\$475
SyQuest 105mb Cartridge/5 Pack	\$79/\$390

All SyQuest Drives come with FWB™ HDT Formatting Software. SyQuest carries a TWO year Warranty on Drives and ONE year on Cartridges. *READS AND WRITES 44 AND 88 CARTRIDGES. Does not format 44 cartridges.

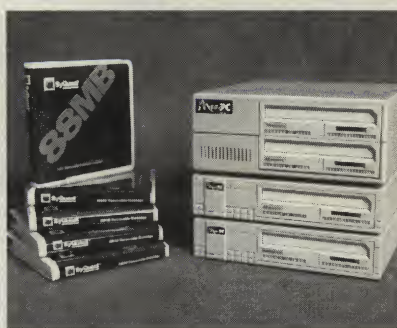
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Model	Capacity	Size	Seek	RPM	External
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5031E	650mb	5.25"FH	28ms	3600	\$2295
128mb/650mb Cartridge (Tosoh/3M)					\$39/\$99

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- External Kits include all necessary cables, one optical media, and FWB™ HDT Formatting Software.
- One year warranty

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Duo 230 4/80 - 4/120	\$2199/\$2539
Powerbook 145 4/40 - 4/80	\$2049/\$2389
Powerbook 160 4/40 - 4/80 - 4/120	\$2319/\$2659/\$2999
Powerbook 180 4/80 - 4/120	\$3919/\$4269
Powerbook 165 Color 4/80 - 4/120 SPECIAL!	\$2799/\$2999
Classic Color 4/80 SPECIAL!	\$1349
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Centris 610 8/230 w/ CD-ROM	\$2599
Centris 650 8/230 w/ CD-ROM	\$3599

Quadra 950 8/0	\$4639
Quadra 800 8/230 - 8/500 w/CD-ROM	\$3999/\$4999

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GCC WriteMove II Printer	\$499
AE AxCell (Cellular Phone Interface)	\$270
AE DataLink PB	\$473
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E-Mach PowerLink Presenter	\$479
Duos:	
Duo Floppy Adapter	\$135
HDI-20 Ext. 1.44mb Floppy Drive	\$199
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I/O Design Ultimate SL/EX - nylon	\$69/\$79

For memory see Macintosh SIMMS section on next page, and for 2.5" drives see Quantum and Toshiba section above.

Quantum

"An Apple Authorized Brand"

Formatted Capacity	Speed	Size	Internal	External
ELS 42mb	19ms	3.5"TH	\$169	\$229
ELS 85mb	17ms	3.5"TH	\$195	\$255
ELS 127mb	17ms	3.5"TH	\$225	\$285
ELS 170mb	17ms	3.5"TH	\$245	\$305
LPS 240mb	10ms	3.5"TH	\$329	\$389
LPS 525mb	10ms	3.5"TH	\$839	\$899
Pro 700mb	10ms	3.5"HH	\$1049	\$1109
Pro 1.05gb	10ms	3.5"HH	\$1135	\$1195
Pro 1.22gb	10ms	3.5"HH	\$1295	\$1355
GRS-80mb	16ms	2.5"PB	\$285	\$385
GO-120mb	16ms	2.5"PB	\$335	\$435

TWO year Warranty. ONE year Warranty on GO drives. FWB™ HDT Formatting Software Included.

TOSHIBA

Formatted Capacity	Speed	Size	Internal	External
877mb	12.5ms	3.5"HH	\$999	\$1059
1.23gb	12.5ms	3.5"HH	\$1099	\$1199
213mb	12ms	2.5"PB	\$545	\$645

Toshiba carries a THREE year Warranty. FWB™ HDT Formatting Software Included.

FUJITSU

SPECIAL!
Fujitsu 520mb Int.
- \$779 -

Formatted Capacity	Speed	Size	Internal	External
513mb SPECIAL!	9ms	3.5"HH	\$779	\$839
1.0gb SPECIAL!	9ms	3.5"HH	\$1395	\$1455
1.03gb	15ms	5.25"FH	\$1215	\$1315
1.65gb	15ms	5.25"FH	\$2195	\$2295
2.05gb	12ms	5.25"FH	\$2395	\$2495

FIVE year Warranty. FWB™ HDT Formatting Software Included.

CONNER "An Apple Authorized Brand"

Formatted Capacity	Speed	Size	Internal	External
82mb	17ms	3.5"TH	\$189	\$249
160mb	13ms	3.5"TH	\$245	\$305
206mb	12ms	3.5"TH	\$319	\$379
515mb	10ms	3.5"HH	\$859	\$919

TWO year Warranty. FWB™ HDT Formatting Software Included.

MICROPOLIS "Novell Certified"

Formatted Capacity	Speed	Size	Internal	External
698mb	10ms	3.5"HH	\$1235	\$1295
1.05gb	10ms	3.5"HH	\$1335	\$1395
2.1gb	12ms	5.25"FH	\$2695	\$2795

FIVE year Warranty. FWB™ HDT Formatting Software Included.

Maxtor

SPECIAL!
1.15gb 3.5"HH 6300RPM
- \$1399 -

Formatted Capacity	Speed	Size	Internal	External
120mb	15ms	3.5"TH	\$209	\$269
203mb	15ms	3.5"TH	\$299	\$359
520mb / 6300 RPM	9ms	3.5"HH	\$899	\$959
1.15gb/6300 RPM	9ms	3.5"HH	\$1399	\$1459
1.0gb	13ms	5.25"FH	\$1179	\$1279
1.43gb	13ms	5.25"FH	\$1429	\$1529

ONE and TWO year Warranty on 3.5" Drives and TWO Years on 5.25" Drives. FWB™ HDT Formatting Software Included.

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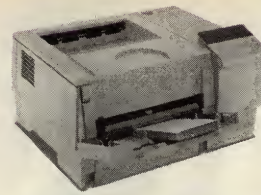
MultiSync 3FGe - 15" Monitor.....	\$635
MultiSync 4FGe - 15" Monitor.....	\$745
MultiSync 5FGe - 17" Monitor.....	\$1145
MultiSync 5FG - 17" Monitor.....	\$1345
MultiSync 6FG - 21" Monitor.....	\$2445
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FG24x 24-bit board.....	\$1205
FG24xp 24-bit board.....	\$505
CD-Express.....	\$355
CD-ROM CDR-74.....	\$625
Multi-Media Gallery.....	\$805
SilentWriter 95F Printer.....	\$1289
SilentWriter 95FX Printer.....	\$1529
SilentWriter 97F Printer.....	\$1569
SilentWriter 97FX Printer.....	\$1809
ColorMate PS-40 Color Printer.....	\$3399
2mb upgrade for printers.....	\$95



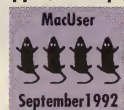
NEC MultiSync 5FG Monitor
 • 17" Multi-Frequency Color Monitor
 • AccuColor Control System
 • Up to 1024x768 resolution



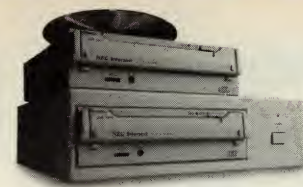
\$1345



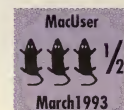
NEC SilentWriter Model 95f Laser Printer
 • PostScript Level 2
 • Envelope feeder and cassette included
 • 6ppm/300dpi/2mb RAM



\$1289



NEC CDR-74 CD-ROM Reader
 • 280ms access time
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ThunderLight	\$1759
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Thunder 8	\$1149
Spectrum/8.24 PDQ	\$799
Spectrum/8.24	\$619
Spectrum/8 LC-SI/NUBUS	\$429/\$359
SuperMatch 21" TPD Color	\$2469
SuperMatch 20" DM Trinitron	\$2509
SuperMatch 20" Color	\$1539
SuperMatch 17" MM Color	\$1059
SuperMatch 17-T Trinitron	\$1099
Platinum 21" TPD	\$1059
Platinum 20" TPD	\$879
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20" Color Trinitron MultiScan RO	\$2349
20" Color Hitachi MultiScan	\$1339
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PrecisionColor 24XP Interface	\$499
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VideoVision (Presentation)	\$2019
Rockets 25i/Rockets 33	\$999/\$1479
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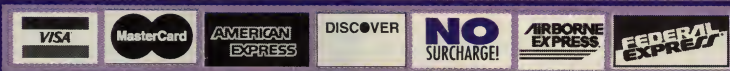
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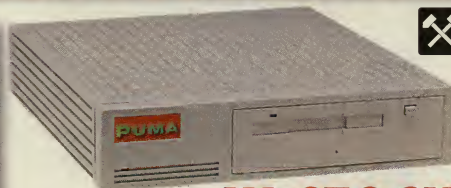
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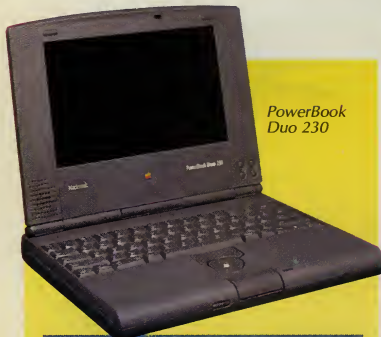
Quadra 800/Trinitron Intermediate Graphics Solution. Quadra 800 with 8 MB of RAM, 230 MB hard drive, RealTech 20" Trinitron monitor, and KeyTronic MacPro Plus extended keyboard.

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Radius 21" Color **2399**
SuperMac 21" Mono/Grayscale **1029**

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RasterOps 20/20[™] MultiScan **1499**
RealTech 20" Trinitron Multi-Mode **1895**
SuperMac 20" (SuperMatch) **1499**
SuperMac 20" (SuperMatch 20•T Multi-Mode XL) **2559**

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NEC 17" 5FG Color **1299**
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SuperMac 17" (SuperMatch) **1029**
SuperMac 17" Trinitron **1059**

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NEC 15" 4FG Color **849**
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RasterOps

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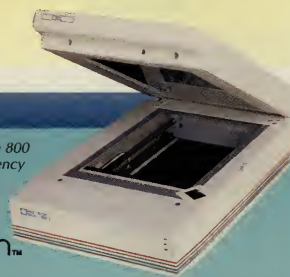


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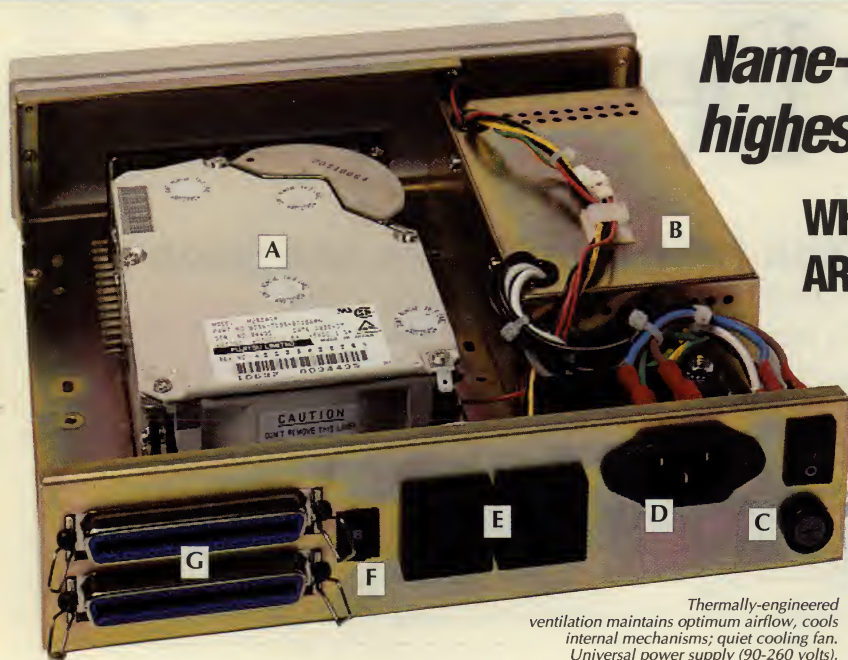
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Includes Retrospect 2.0 backup software.

TEAC 155 MB Drive ... \$499

TEAC 600 MB Drive ... 699

REALTECH DAT

DDS-DC Drive (2-8 GB capacity; 1 yr. warranty; includes Retrospect 2.0 backup software) \$1399

The RealTech DAT Drive uses industry-standard DDS-DC compression on a 90-meter tape. Depending on your data, storage capacities may vary from 2 to 8 GB.

SYQUEST®

44 MB Drive \$389

88c MB Drive 599

*Includes one disk or tape

REMOVABLE MEDIA

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652 MB M-O Cartridge 159

1.0 GB ZCAV M-O Cartridge 199

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600 MB TEAC Tape 28

60-meter DAT Tape \$13

90-meter DAT Tape 16

44 MB SyQuest Cartridge \$63

88 MB SyQuest Cartridge 97

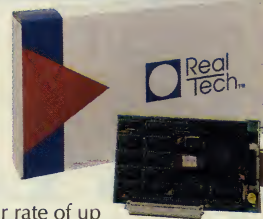
REALTECH DRIVE UTILITIES SOFTWARE

Included with your drive, for efficient operation. Disk partitioning; password protection; diagnostic testing; multiple SCSI-bus support; extensive on-line help; and more. Also included with your drive, System 7.0.1.

REALTECH SCSI-2 CARD

Allows all NuBus Macs to communicate with newer, high-performance hard drives at substantially faster transfer rates.

Sustained transfer rate of up to 4.4 MB per second, plus a burst transfer rate of 6 MB per second (6/10 on a Quadra). Mirroring capabilities \$299



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During the past eight years, we've become America's one-stop source for Macintosh solutions. Now we can be your one-stop source for storage solutions, too.

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...because we're interested in being your total solutions partner. And because we'll be around to help you. We believe in building relationships and making sure you get the best solutions possible, not just the products with the most bells and whistles.

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When you order from us, you get computer experts, not clerks! All of our salespeople are trained in Apple's intensive program, as well as our own. On average, they have three years of Mac experience. They're ready to help you (with a smile!) both before and after the sale.

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30-DAY MONEY-BACK GUARANTEE on all hardware (except leases, printer consumables and special-order items). Sorry, no returns on PowerBooks. Before returning merchandise, call our Customer Service Dept. toll-free to receive a returned merchandise authorization number (RMA), which must be included with any returns. No C.O.D. returns. Thank you for your cooperation. ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. Hardware That Fits is located at 610 S. Frazier in Conroe, TX 77301.

Do you need a fixed hard drive, or the flexibility of an optical? Call us; we can explain your options.

	Model number	Internal price	External price	Formatted Mac capacity (in MB)	Average access time (in ms)	Transfer rate* (in Mb/second)	Form factor**	Warranty (years)
80 - 120 MB								
Conner 85	CP-30080E	\$209	\$279	82	17	1.5	LP	1
Quantum 85	ELS85	205	275	82	17	1.4	LP	2
Conner 120	CP-30100	259	329	116	17	1.5	LP	1
Maxtor 120	7120	209	279	121	15	1.5	LP	2
120 - 250 MB								
Quantum 127	ELS127	\$259	\$329	124	17	1.4	LP	2
Conner 170	CP-30170E	289	359	160	9	1.5	LP	1
Quantum 170	ELS170	279	349	160	17	1.4	LP	2
Conner 212	CP-30200	369	439	206	12	2.5 ¹	LP	1
Maxtor 213	7213	299	369	207	15	2.8 ¹	LP	2
Quantum 240	LPS240	369	439	234	10	1.4	LP	2
Maxtor 245	7245	329	399	245.6	15	3.0 ¹	LP	2
320 - 570 MB								
Maxtor 340	LXT-340	\$599	\$669	324	15	2.1 ¹	HH	2
Fujitsu 520	M2624FA	819	889	496	9	2.7 ¹	HH	5
Quantum 525	LPS525	929	999	525	10	2.9 ¹	LP	2
Maxtor 540	MXT-540	919	989	546	9	5.5 ²	HH	2
Conner 540	CP-3540	899	969	515	12	5.5 ²	HH	1
Micropolis 560	M2105	1049	1119	532	10	5.0 ²	HH	5
700 MB - 1.3 GB								
Quantum 700	PRO700	\$1249	\$1319	670	10	2.9 ¹	HH	2
Micropolis 800	M2108	1199	1219	698	10	5.0 ²	HH	5
Toshiba 877	MK-438FB	1099	1169	830	12.5	3.0 ¹	HH	2
Quantum 1050	PRO1050	1419	1489	1000	10	2.9 ¹	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8 ¹	FH	5
Fujitsu 1.2	M2266	1249	1349	1079	14.5	3.0 ¹	FH	5
HP 1.2	C2247	1589	1659	1000	10.5	5.3 ¹	HH	5
Micropolis 1.2	M2112	1249	1319	1005	10	5.0 ²	HH	5
Quantum 1.2	PRO1225	1599	1669	1200	10	2.9 ¹	HH	2
Toshiba 1.2	MK-538FB	1399	1469	1200	12.5	4.0 ¹	HH	3
Maxtor 1.2	MXT-1240	1399	1469	1240	9	4.5 ²	HH	3
Conner 1.3	CP-31370	2059	2129	1030	10.5	6.0 ¹	HH	1
1.5 - 3.6 GB								
Fujitsu 2.0	M2652	\$2299	\$2399	1752	11	4.8 ²	FH	5
Seagate 2.1	ST42100N	1999	2099	1900	12.9	3.9 ²	FH	5
Fujitsu 2.4	M2654	2549	2649	2000	11	4.8 ²	FH	5
Micropolis 2.4	M1924	2599	2699	2100	10	4.8 ²	FH	5
Seagate 2.4	ST42400N	2879	2979	2050	11	4.5 ²	FH	5
HP 2.4	C3010	2899	2999	2000	11.5	5.3 ²	FH	5
Seagate 3.4	ST43400N	3999	4099	2750	11	6.0 ²	FH	5
Micropolis 3.6	M1936	3299	3399	3022	10	6.0 ²	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. **Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.

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PBTools
(a \$99. value)
FREE with
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purchase!

Mechanism	Capacity	Average Seek Time	Price	Price w/6MB Coyote 140/170 RAM	Price w/10MB Coyote 160/180 RAM	Warranty*
RR120i	120MB	17ms	\$ 399	\$ 699	\$ 809	2 years
RR200i	201MB	12ms	\$ 649	\$ 949	\$1059	2 years

Coyote PowerBook RAM is TSOP low profile, pseudoStatic, low power chips on rigid boards with protective mylar shielding. Call for latest pricing. *Five year warranty on memory.



Genesis 650 Magneto-Optical Drive

This half-height 650MB MO fits as neatly on your desktop as it does inside your Quadra 950, safely stores your data for up to fifteen years, and has a quick 40ms average seek time. Affordably priced, the Genesis 650 is *the* optical for every desktop. No wonder *Macworld UK* said Genesis 650 is an "excellent value *with* a two year warranty."

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For use in the Quadra 900 or 950,
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Complete with 25-50 and
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Quality engineered in our own labs, Polaris drives deliver the best components, high level design and rigorous quality control testing Microtech is famous for. Polaris drives ship complete with double shielded twisted pair SCSI cables for external models; complete brackets and installation manual for internals.

Mechanism	Capacity	Average Seek Time	Rotational Speed	Form Factor	External Model	Internal Model	Warranty
Maxtor 7213	207MB	15ms	3500 RPM	3.5" *	\$ 429	\$ 339	2 years
Maxtor MXT540	520MB	9ms	6300 RPM	3.5" *	\$1039	\$ 949	2 years
Maxtor MXT1240	1150MB	9ms	6300 RPM	3.5"	\$1539	\$1449	3 years
Micropolis 2112	1.0GB	10ms	5400 RPM	3.5"	\$1499	\$1409	5 years

*low profile

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A Microtech warranty covers:

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APS Turbo DAT
\$1499



APS DAT
\$1199

Why do the biggest DAT customers in America insist that "APS" be the three letters in front of the DAT when they buy?... It's simple. Nobody sells more DATs. Nobody knows Macintosh DAT like APS. That's why we can bring you incredible values in DAT technology.

The APS Turbo DAT is based on Archive's Turbo Python DAT Mechanism, the fastest DAT mechanism available with speeds as high as 17MB per minute. The APS Turbo DAT is more than 20% faster than all other DAT units and can store up to 5GB on a 90 meter tape.

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*Retrospect
included with
all Mac tape
drives*



DAT

Model	Internal*	External
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APS DAT	1099	1199

*Internal models for Quadra 900 & 950

All APS DAT Drives Include Retrospect by Dantz

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APS 155 MB Tape Back Up	\$499
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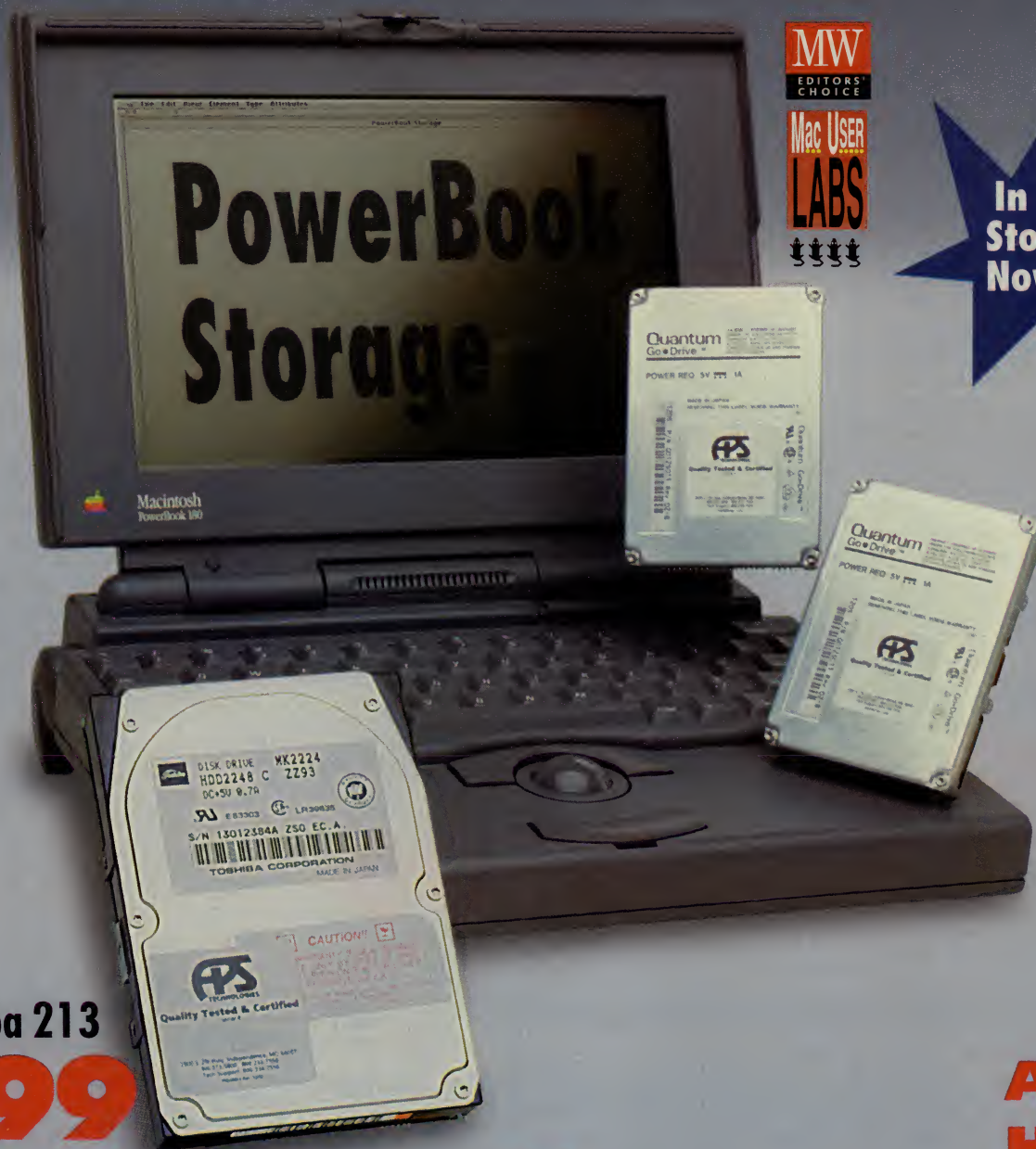
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APS SCSI Boy \$29

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APS PowerBook Drives



QUANTUM GO•DRIVES

Model	Internal	External
APS 80GRS ¹	\$299	\$429 [†]
APS 120 ¹	339	469 [†]
APS 160GRS ¹	499	629 [†]

†Battery-Powered Companion Case for the PowerBook

TOSHIBA

APS T 213 ¹	599	729 [†]
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Toshiba 2224 mechanism

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Dantz's Disk Fit
Direct included with
all drives



APS HARD DRIVES

Model	Internal	External
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QUANTUM

APS Q 85 ELS ²	\$199	\$269
Quantum 85ELS mechanism		
APS Q 127 ²	229	299
Quantum 127ELS mechanism		
APS Q 170 ²	259	329
Quantum 170 ELS mechanism		
APS Q 240 ²	339	409
Quantum LP240 mechanism		
APS Q 525 ²	899	969
Quantum Lps525 mechanism		
APS Q 1225 ⁵	1359	1429
Quantum 1225P mechanism		

TOSHIBA

APS T 1.2G ³	1099	1169
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Toshiba MK-538 mechanism

¹⁻⁵ Denotes length of manufacturer's warranty

APS Technologies

Storage Source



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The APS SyQuest 44 and 88 are the transportable storage standard in the Macintosh market. Extraordinary engineering and attention to detail make the APS SyQuest the quality leader.

You get industry-wide 44MB compatibility with the APS SQ-555, 44MB drive. The APS SQ-5110 gives you the benefits of 88MB capacity, yet can read 44MB cartridges. The APS SQ-5110c delivers the best of both worlds, reading or writing both 44MB* and 88MB cartridges!

All SyQuest drives sold with one preformatted cartridge.
*(does not format 44MB cartridges)

APS REMOVABLE CARTRIDGE DRIVES

SYQUEST DRIVES

Model	MB	External
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APS SQ5110	88MB	489
APS SQ5110c	44/88	569
APS SQ3105	105	749



New

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APS MS 1.1G ⁵ Micropolis 2112 mechanism	1299	1369
APS MS 2.4G ⁵ Micropolis 1924 mechanism	2699	2799



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APS F 520 ⁵ Fujitsu M2624S mechanism	799	869
APS F 1.2G 5.25" ⁵ Fujitsu M2266 mechanism	1249	1349
APS F 1.2G 3.5" ⁵ Fujitsu M2694 mechanism	1599	1669
APS F 2.0G ⁵ Fujitsu M2652 mechanism	2249	2349

Model	Internal	External
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MAXTOR

APS MX 120 ² Maxtor 7120 mechanism	\$199	\$269
APS MX 213 ² Maxtor 7213 mechanism	279	349
APS MX 340 ² Maxtor LXT340 mechanism	499	569
APS MX 540 ² Maxtor MXT540 mechanism	899	969
APS MX 1240 ³ Maxtor MXT1240S mechanism	1499	1569



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- Toll-free technical support as often or for as long as you need. Regular hours are 8 am to 8 pm Monday thru Friday.

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Model	Internal*	External
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Mechanism is Epson Magneto-Optical OMD-5010
128MB Magneto Optical Drive * Internal models for Quadra 900 and 950

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Model	External	Special
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*Includes Four-Disc APS CD bundle, including Multimedia Encyclopedia, Sherlock Holmes interactive detective game and more.



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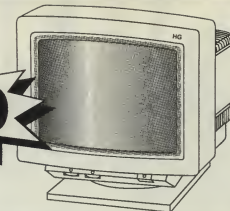
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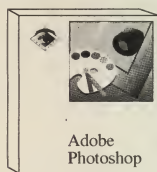
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24-bit color NuBus card with QuickDraw acceleration



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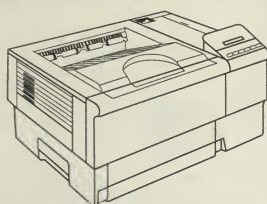
NEC

Silentwriter® Model 95fx
with PostScript® Fax Option

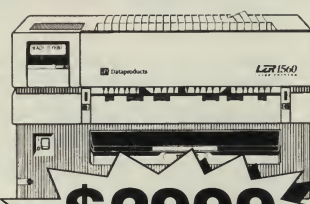
• Receive and print conventional or high-quality PostScript faxes on plain paper
• 2MB RAM / 6ppm / 35 resident fonts
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\$1149*

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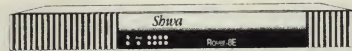
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LanRover/L is a dial-in server that provides PowerBook and Macintosh users with fast, easy, access to all network services.

NetModem/E Thick, Thin or 10BaseT **\$1399**
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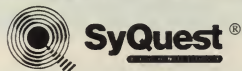
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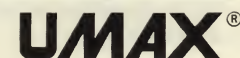


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for Macs
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UMAX UC-630 **\$1075**
600 dpi color with PhotoShop®
Transparency/Slide Adapter
for UC-630 **\$699**
UMAX UC-840 **\$1299**
800 dpi color scanner with PhotoShop®
UMAX UC-1200 **\$2999**
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2MB SIMMs **\$69**
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4MB SIMMs for LC III, Centris **\$149**
8MB SIMMs for LC III, Centris **\$299**
16MB SIMMs **\$549**
16MB SIMMs for LC III, Centris **\$599**
256K VRAM **\$36**
4MB for PowerBook 160/180 **\$239**
4MB for PowerBook Duo 210/230 ... **\$239**
6MB for PowerBook 140/170 **\$229**
8MB for PowerBook Duo 210/230 ... **\$419**
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Macintosh Classic II	Centris 610
Mac Color Classic	Centris 650
Macintosh LCIII	Quadra 800
Macintosh IIvx	Quadra 950
Macintosh WorkGroup Servers	



PowerBooks

PowerBook 160	PowerBook Duo 210
PowerBook 165c	PowerBook Duo 230
PowerBook 180	Apple DuoDock

Mid-Range Solutions



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#6 Hard Drives ...

Hard Drives and More...

We have internals, externals, multiple drive configurations, 2.5", 3.5", 5.25, Syquest removables, magnetic opticals, CD-ROMs, and tape drives from every manufacturer. Here are some of our hottest items.

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	Internal	External
85MB ELS	\$197	\$254
127MB ELS	229	289
170MB ELS	259	319
240MB LPS	339	399
525MB LPS	879	929
1225MB LPS	1399	1449

Maxtor®

	Internal	External
213MB	Call	Call
340MB	619	679
760MB	1225	1320
1.2GB	1349	1459
1.7GB	1599	1719

FUJITSU

	Internal	External
425MB	\$849	\$889
520MB	889	949
1.07GB	1549	1609
1.2GB	1289	1399
2.0GB	2499	2599

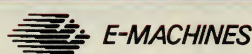
#7 Video ...

Video and More...

We have monitors and boards from every leading manufacturer including Sony, Seiko, Apple, RasterOps SuperMac, E-Machines, Sigma Designs, Radius, Lapis, Magnavox and others. We can even help you mix and match to get the most value for your money.



12" Monochrome Monitor	\$225
14" RGB Monitor with swivel	541
15" Portrait Display	795
16" RGB Monitor	1283
21" RGB Monitor	3181



16" E-Machines T16II	\$1285
20" E-Machines Trinitron	Call
DoubleColor SX	369
DoubleColor LX	649
Futura SX	489
Futura MX	805
Futura LX	1029

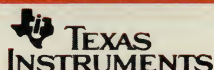
radius

Radius Monochrome FPD	\$589
Radius Monochrome Card	259
Radius Precision Color Pivot	985
Radius Color Pivot Board	499
Radius 21" Two-page Color	2469
8XJ Video Board	515
24XK Video Board	859

#9 Printers, etc...

Printers, Scanners and More...

We can help you make those tough decisions between TrueType and PostScript; speed vs cost; and those special features. These are just a few of the manufacturers we carry.



TI microWriter PS23	Call
TI microWriter PS65	Call
TI microLaser PS17	\$1139
TI microLaser PS35	1269
TI microLaser Turbo	1459



QMS PS 410	\$1499
QMS PS 815	2999
QMS PS 825	3499
QMS PS 860 Hammerhead	3999
QMS ColorScript 210/230	Call



GCC PLP II	\$673
GCC BLP Elite	899
GCC BLP IIs	1139
GCC BLP II	1549
GCC WriteMove II	529
GCC BLP Eclipse 4ppm/8ppm	NEW

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complete system is as simple as 1, 2, 3.

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<input type="checkbox"/> Standard SIMMS	1, 4, 8, 16 MB
<input type="checkbox"/> PowerBook 160/180	4, 6, 8, 10 MB
<input type="checkbox"/> PowerBook 165c	4, 6, 8, 10 MB
<input type="checkbox"/> Duo 210/230	4, 8 MB
<input type="checkbox"/> LC III & Centris	4, 8, 16, 32 MB
<input type="checkbox"/> Quad 800	4, 8, 16, 32 MB

#3 Keyboards

<input type="checkbox"/> ETC PowerGlide Exten. Keyboard	\$99
<input type="checkbox"/> ETC PowerBook ADB Keypad	75
<input type="checkbox"/> Apple Standard Keyboard	99
<input type="checkbox"/> Apple Exten. Keyboard	179
<input type="checkbox"/> ETC Foreign Language Keyboards	call

#4 Accelerators...

<input type="checkbox"/> AE TransWarp LC-vf 25MHz w/fpu	\$476
<input type="checkbox"/> AE TransWarp LC-vf 33MHz w/fpu	527
<input type="checkbox"/> Daystar 40MHz PowerCache w/fpu	649
<input type="checkbox"/> Daystar 50MHz PowerCache w/fpu	859
<input type="checkbox"/> Radius Rocket 33	1999
<input type="checkbox"/> Radius Rocket Share	439


#5 Network

<input type="checkbox"/> ETC DataFlow AAUI adapters	from \$79
<input type="checkbox"/> ETC DataFlow II (Tk/Tn or Tk/T)	155
<input type="checkbox"/> ETC DataFlow II Combo3	199
<input type="checkbox"/> ETC DataFlow LC (Tn/T)	185
<input type="checkbox"/> ETC Ethernet Thin Repeater	339
<input type="checkbox"/> ETC 10BaseT 12-Port Hub	529

Ask about the entire DataFlow line!

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	Internal	External
<input type="checkbox"/> 877MB	\$1089	\$1155
<input type="checkbox"/> 1.2GB	1399	1499
<input type="checkbox"/> 213 (2.5" for powerbook)	529	
<input type="checkbox"/> CD-ROM 3401	Call	689




<input type="checkbox"/> 44mb SyQuest	Special	\$359
<input type="checkbox"/> 88mb SyQuest		449
<input type="checkbox"/> 88c SyQuest		529
<input type="checkbox"/> 105mb SyQuest		In Stock!
<input type="checkbox"/> Dual 44/88c SyQuest		859

With 1 - 44mb cartridge. Add an 88 cartridge for \$99

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<input type="checkbox"/> 127MB Magnetic Optical	\$1099
<input type="checkbox"/> 650MB Magnetic Optical	2299
<input type="checkbox"/> 44 MB Syquest Cartridge	63
<input type="checkbox"/> 88MB Syquest Cartridge	99
<input type="checkbox"/> 105Syquest Cartridge	call
<input type="checkbox"/> 127 MO Cartridge	49

Data Compression SCSI Bus Expansion




from \$399

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<input type="checkbox"/> SuperMatch 17" Trinitron	\$1089
<input type="checkbox"/> 20" Color Dual-mode Trinitron	2499
<input type="checkbox"/> 21" Color Two-Page Monitor	2499
<input type="checkbox"/> Spectrum/8 Series III	419
<input type="checkbox"/> Spectrum/24 Series IV	829
<input type="checkbox"/> Spectrum/24 PDQ+	1509
<input type="checkbox"/> SuperMac Video Spigot	Call

RasterOps

<input type="checkbox"/> 20" Hitachi Color Monitor	\$1409
<input type="checkbox"/> 20T Multi-Scan Color Monitor	2299
<input type="checkbox"/> 21" Color Monitor	2499
<input type="checkbox"/> 8XL Video Board	469
<input type="checkbox"/> 8XLI Video Board	924
<input type="checkbox"/> PaintBoard Li Video Board	825
<input type="checkbox"/> 20XLI Video Board	1895

SIGMA DESIGNS

<input type="checkbox"/> ColorMax 15 Monitor	\$769
<input type="checkbox"/> ColorMax 20T Monitor	2199
<input type="checkbox"/> 15" PageView GS	439
<input type="checkbox"/> Silver Pro Grey Scale	1049
<input type="checkbox"/> ColorMax 17" System	2189
<input type="checkbox"/> Power Portrait	639

#8 Modems ...

<input type="checkbox"/> PSI Power Modem II	\$239
<input type="checkbox"/> PSI Com Station V	529
<input type="checkbox"/> Global Village Teleport Gold	429
<input type="checkbox"/> Global Village Powerport Silver	379
<input type="checkbox"/> Global Village Powerport Gold	439
<input type="checkbox"/> Supra FaxModem 14.4 V.32	359
<input type="checkbox"/> AE DataLink PB Data/Fax/Voice	492

Apple®

<input type="checkbox"/> Apple LaserWriter Select 310	\$1059
<input type="checkbox"/> Apple Personal LaserWriter NTR	1336
<input type="checkbox"/> Apple LaserWriter IIx	1620
<input type="checkbox"/> Apple LaserWriter Pro 630	2419
<input type="checkbox"/> Apple One Color Scanner	1318

UMAX®

<input type="checkbox"/> UC 630LE w/photoshop	call
<input type="checkbox"/> UC 630 Color Scanner	\$1149
<input type="checkbox"/> UC 840 Color Scanner	1299
<input type="checkbox"/> UC 1200 Color Scanner	2999
<input type="checkbox"/> Transparency Option	699

MICROTEK

<input type="checkbox"/> Microtek Scanmaker II	\$929
<input type="checkbox"/> Microtek Scanmaker IIXE	1189
<input type="checkbox"/> Microtek 1850s Slide Scanner	1599

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425MB
\$739

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Unformatted Capacity	Access	Internal	External
80mb	17ms	\$289	\$389
120mb	17ms	\$339	\$439
160mb	17ms	\$469	\$569

LPS SERIES 3.5" LOW PROFILE

Unformatted Capacity	Access	Internal	External
120mb	10ms	\$269	\$329
240mb	10ms	\$325	\$385
525mb	10ms	\$839	\$899

ELS SERIES 3.5" LOW PROFILE, LOW POWER

Unformatted Capacity	Access	Internal	External
42mb	19ms	\$169	\$229
85mb	17ms	\$195	\$255
127mb	17ms	\$219	\$279
170mb	17ms	\$239	\$299

PRODRIVE SERIES 3.5" HALF HEIGHT

Unformatted Capacity	Access	Internal	External
425mb	9ms	\$739	\$799
700mb	10ms	\$1075	\$1135
1.0GIG	10ms	\$1149	\$1209
1.2GIG	10ms	\$1299	\$1359



CLUBMAC 3.5" 105MB REMOVABLES

ClubMac 105mb External (SQ3105A)	\$749
ClubMac 105mb Internal (Q900/950)	\$719

CLUBMAC 88c REMOVABLES*

ClubMac 88c External (SQ5110C)	\$555
ClubMac 88c Internal	\$525
ClubMac 88c Dual	\$999

* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.

CLUBMAC 44MB REMOVABLES

ClubMac 44mb External (SQ555)	\$378
ClubMac 44mb Internal	\$348
ClubMac 44mb Dual	\$669

CLUBMAC 88MB REMOVABLES

ClubMac 88mb External (SQ5110)	\$479
ClubMac 88mb Internal	\$449
ClubMac 88mb Dual	\$849

SYQUEST CARTRIDGES

105mb / 88mb / 44mb	\$79 / 97 / 63
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SyQuest Drives carry a TWO Year Warranty.
SyQuest Cartridges carry a ONE Year Warranty.

Maxtor

***6300 RPM**



Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
XT SERIES & MXT SERIES (3.5" LOW PROFILE)					
120mb	7120S	15ms	121mb	\$199	\$259
207mb	7213S	15ms	202mb	\$279	\$339
540mb*	MXT-540	8.5ms	521mb	\$899	\$959
LXT & MXT SERIES (3.5" HALF HEIGHT)					
340mb	LXT-340	15ms	324mb	\$499	\$559
1240mb*	MXT-1240	8.5ms	1150mb	\$1339	\$1399
PANTHER SERIES (5.25" FULL HEIGHT)					
1.2GIG	PO-12S	13ms	997mb	\$1049	\$1149
1.7GIG	P1-17S	13ms	1433mb	\$1299	\$1399

Maxtor drives carry a TWO Year Warranty.



Seagate

FEATURING...THE ELITE DRIVES

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" Disk Drives						
248mb	ST3283N	Low Profile	12ms	235mb	\$365	\$425
1.2GIG	ST11200N	Half Height	10.5ms	1000mb	\$1149	\$1209
WREN AND ELITE SERIES (5.25" FULL HEIGHT)						
645mb	ST4767N	Wren Runner II	11.9ms	634mb	\$1069	\$1169
1.2GIG	ST41200N	Wren-7	15ms	989mb	\$1149	\$1249
1.6GIG	ST41651N	Wren-8	15ms	1350mb	\$1349	\$1449
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	\$1725	\$1825
1.6GIG	ST41600N	Elite-1	11.5ms	1307mb	\$1825	\$1925
2.4GIG	ST42400N	Elite-2	11ms	2050mb	\$2439	\$2539
3.4GIG	ST43400N	Elite-3	11ms	2750mb	\$2949	\$3049

Seagate drives carry a ONE Year Warranty.



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TAPE BACKUP MEDIA

60 METER DAT	\$13
90 METER DAT	\$16
CT600N	\$19
CT600F	\$28
EXABYTE 8MM	\$18

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WITH
RETROSPECT v2.0
BACKUP SOFTWARE

Capacity	Model	Description	Media	Internal	External
155mb	Teac MT2ST/N50	Analog	CT600N	\$429	\$449
600mb	Teac MT2ST/F50	Analog	CT600F	\$629	\$649
2.0GIG	Archive Python	DAT, DDS	4mm	\$979	\$999
3-5GIG	Archive Turbo DAT	DAT, DDS-DC	4mm	\$1329	\$1349
2.0GIG	WangDAT 3100	DAT, DDS	4mm	\$1045	\$1065
3-5GIG	WangDAT 3200	DAT, DDS-DC	4mm	\$1279	\$1299
2.0GIG	Hewlett Packard 35470A	DAT, DDS	4mm	\$1229	\$1249
3-5GIG	Hewlett Packard 35480A	DAT, DDS-DC	4mm	\$1379	\$1399
2-5GIG	Exabyte 8205	Helical/Compression	8mm	\$1675	\$1695
5-10GIG	Exabyte 8505	Helical/Compression	8mm	\$2629	\$2649

Includes Retrospect v2.0 Backup Software, One Tape and ONE Year Warranty

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Model		Capacity	Description	Seek	Internal	External
CMO-M2511A	Fujitsu	128mb	3.5" Low Profile	35ms	\$969	\$999
CMO-OD3000	Teac	128mb	3.5" Half Height	45ms	\$939	\$969
CMO-3100E	Ricoh	128mb	3.5" Half Height	45ms	\$1009	\$1039
CMO-JY750	Sharp	594/652mb	5.25" Half Height	40ms	\$2119	\$2149
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms		\$2345
CMO-Tahiti II	MaxOptix	650mb/1.0GIG	5.25" Full Height	35ms		\$2999
128mb Cartridge		3.5" Single Sided				\$399
594/652mb Cartridge		5.25"-512/1024 bytes/sec				\$999
ZCAV Cartridge		5.25" for MaxOptix				\$1750

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

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40 MHZ POWERCACHE*	\$545 / \$629
50 MHZ POWERCACHE*	\$709 / \$839
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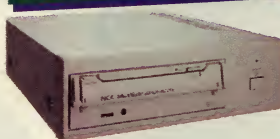
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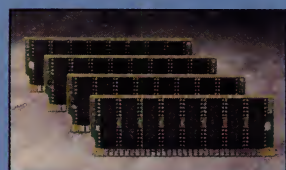
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170	CP-30170E	16	1400	150000	24	\$269	\$329	
213	CP-30200	15	2000	150000	24	\$349	\$399	
Quantum								
85	ELS 85S	17	1800	250000	24	\$199	\$269	
127	ELS 127S	17	1800	250000	24	\$229	\$299	
170	ELS 170S	17	2000	250000	24	\$259	\$329	
240	LPS 240S	16	2300	250000	24	\$329	\$399	
80 (Pwr/bk)	GO 120	17	1900	150000	12	\$349		
Digital Equipment								
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Seagate								
240 (PowerBook)	ST-9295N	16	2100	150000	12	\$549		
1.05GB	ST-11200N	10.5	3200	200000	60	\$999	\$1,049	\$1,099
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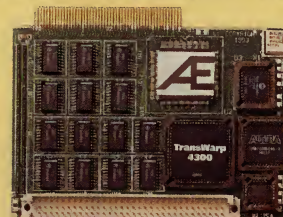
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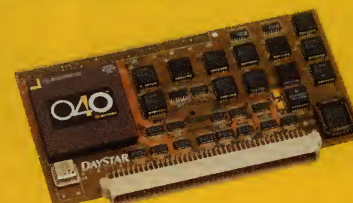
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Upgrade Tip of the Week

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Maximum memory capacity for the IIX, IICX or IICI is expanded to 64MB. Maximum memory for the Mac II is 40MB.

SIMMS can be combined in the following way: Two 1MB SIMMs create a 2MB SIMM, a 1MB SIMM and a 4MB SIMM create a 5MB SIMM, and two 4MB SIMMs create an 8MB SIMM.

The SIMMdoubler II saves the Mac II owner money by eliminating the need for a costly ROM upgrade from Apple, and the need for special PAL SIMMs.

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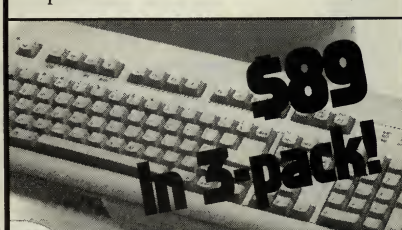
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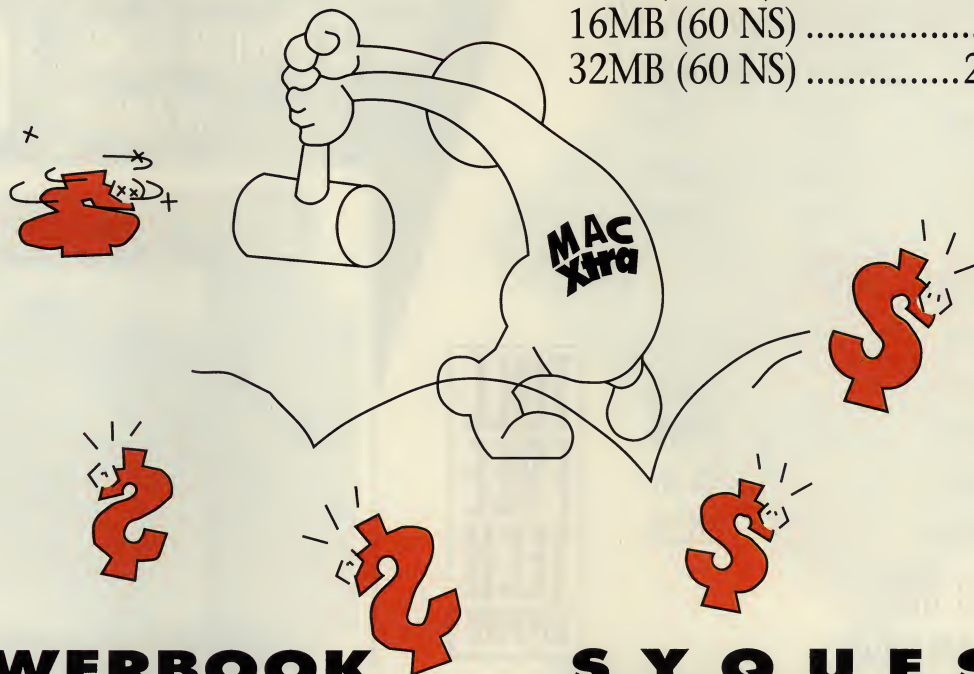
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1x8x70	35
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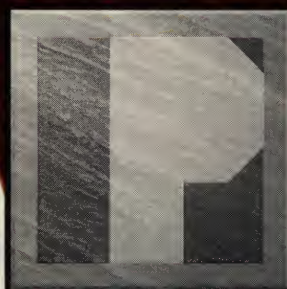
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4 MB Module	189.00	165.00	199.00	205.00	209.00
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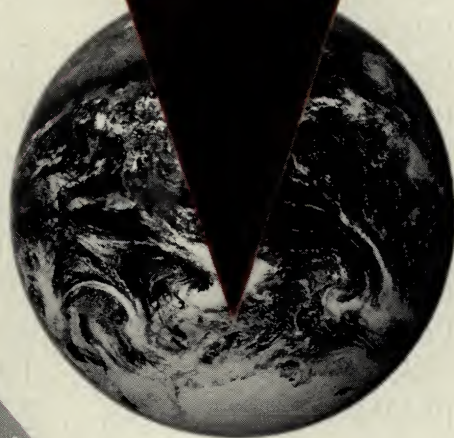
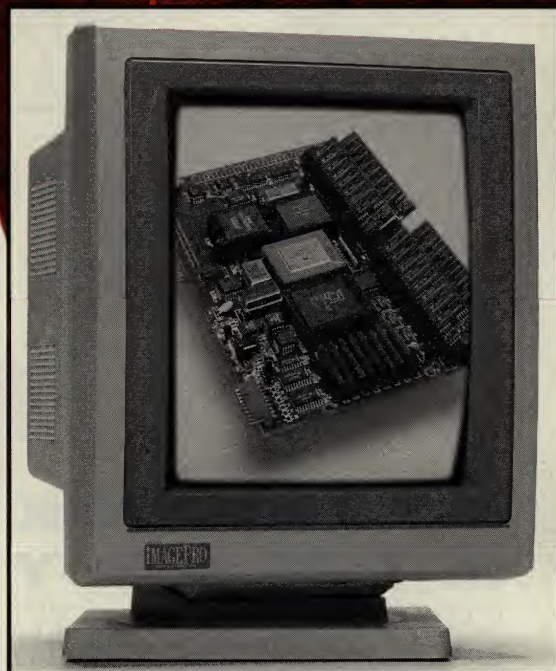
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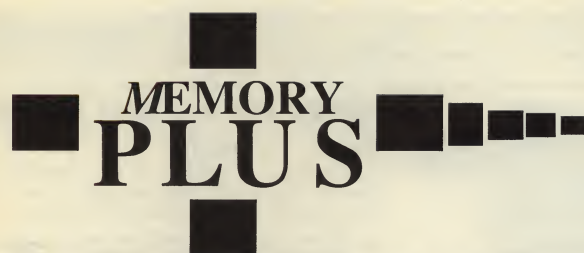
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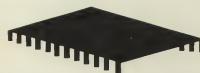
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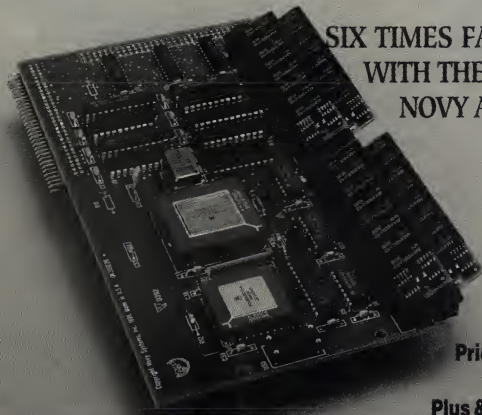
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Quad 700 4/40	2595
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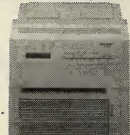
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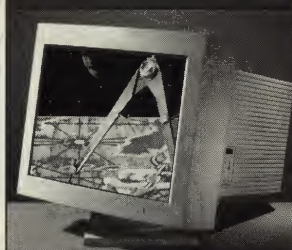
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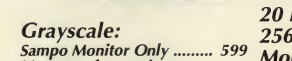

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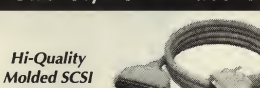
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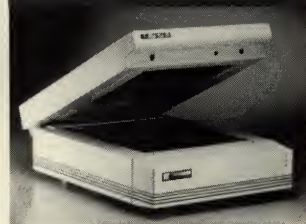
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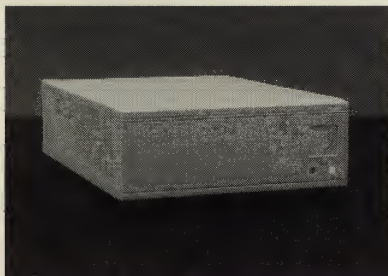
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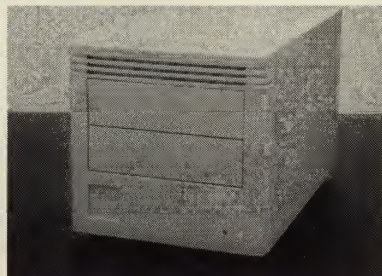
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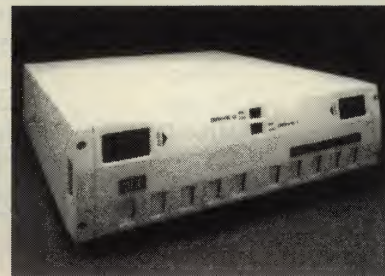
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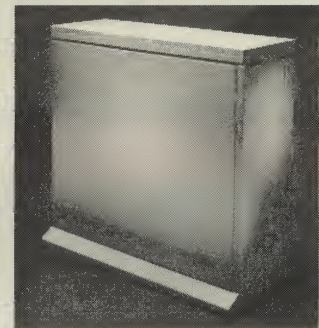
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520	M2624FA	3.5	12	\$ 765	\$865
1079	M2266S	FH	14	\$1189	\$1309
1080	M2694FA	3.5	10	\$1098	\$1198
1750	M2652S	FH	11	\$2033	\$2163
2061	M2654S	FH	11	\$2100	\$2220

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5 YEAR WARRANTY

MB	TYPE	SIZE	SEEK	INT.	EXT.
850	DSP3085S	3.5	9.5	\$1192	\$1287
1050	DSP3105S	3.5	9.5	\$1158	\$1253
1660	DSP3160S	3.5	10	\$1752	\$1847
2000	DSP5200S	FH	12.5	\$1904	\$2024
3500	DSP5350S	FH	11.5	\$3246	\$3366

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MB	TYPE	SIZE	SEEK	INT.	EXT.
560	2105	3.5	10	\$918	\$1018
698	2108	3.5	10	\$1093	\$1193
667	1624	HH	15	\$1028	\$1128
1050	2112	3.5	10	\$1094	\$1194
1340	1528	FH	14.5	\$1312	\$1432
1380	1908	FH	11.5	\$1812	\$1932
2100	1924	FH	11.5	\$C111	\$C121
3050	1936	FH	11	\$2993	\$3123

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MB	TYPE	SIZE	SEEK	INT.	EXT.
245	ST3283N	1"	12	\$ 340	\$ 440
456	ST3550N	1"	12	\$ 815	\$ 915
540	ST3600N	1"	10.5	\$ 855	\$ 955
665	ST4767N	FH	12	\$1025	\$1125
*860	ST1980N	3.5	9.9	\$977	\$1077
1037	ST41200N	FH	16	\$1047	\$1147
*1037	ST11200N	3.5	10.5	\$1020	\$1115
1420	ST41650N	FH	15	\$1228	\$1348
1420	ST41600N	FH	11.5	\$1695	\$1815
*1900	ST42100N	FH	12.9	\$1580	\$1700
*2100	ST42400N	FH	11	\$2217	\$2337
*2900	ST43400N	FH	11	\$2808	\$2928

SPECIALS

TYPE	MB	SIZE	SEEK	INT.	EXT.
Fujitsu	520	3.5"	12	\$ 765	\$ 865
Seagate	1.04GB	3.5"	10	\$1020	\$1115
Fujitsu Optical	128	3.5"	30	\$1020	\$1130
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340	LXT340SY	3.5	13	\$ 557	\$ 652
540	LXT540SY	3.5	8.5	\$ 914	\$1014
1240	1240S	3.5	8.5	\$1322	\$1417
1059	PO-12S	FH	13	\$1063	\$1193
1345	P1-17S	FH	13	\$1265	\$1395

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MB	TYPE	SIZE	SEEK	INT.	EXT.
240	LPS240S	1"	16	\$ 319	\$ 419
525	LPS525S	1"	10	\$ 750	\$ 850
700	PD700S	1"	10	\$1092	\$1192
1050	PD1050S	3.5	10	\$1190	\$1290
1200	PD1225	3.5	10	\$1237	\$1337

CONNER

1 YEAR WARRANTY

MB	TYPE	SIZE	SEEK	INT.	EXT.
170	30170	1"	17	\$ 260	\$ 360
212	30200	1"	12	\$ 333	\$ 430
545	30540	1"	10	\$ 872	\$ 972

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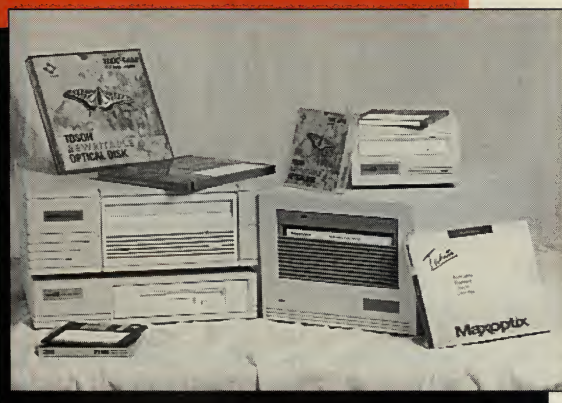
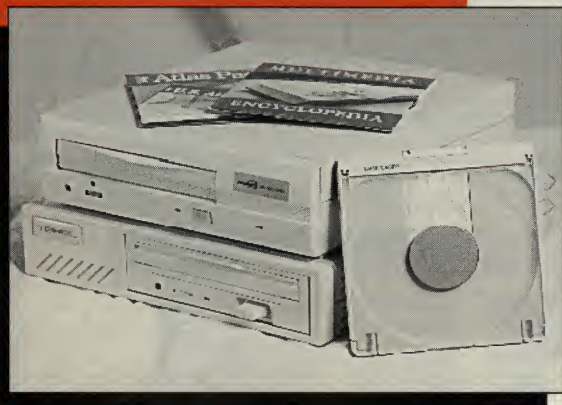
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85Meg	17ms	3600	Quantum	2 Years	\$179	\$249
127Meg	17ms	3600	Quantum	2 Years	\$219	\$289
130Meg	17ms	3600	Maxtor	2 Years	\$209	\$269
170Meg	17ms	3600	Conner	2 Years	\$239	\$299
213Meg	15ms	3600	Maxtor	2 Years	\$299 *	\$369
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240Meg	16ms	4300	Quantum	2 Years	\$317	\$385
340Meg	15ms	3600	Maxtor	1 Year	\$539	\$599
520Meg	12ms	4400	Fujitsu	5 Years	\$769	\$829
540Meg	8.5ms	6300	Maxtor	2 Years	\$889	\$959
877Meg	12ms	3600	Toshiba	5 Years	\$969	\$1039
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Toshiba	200ms	330KB/sec	Battery Powered	N/A	\$729
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2Gig	DAT	Hewlett Packard	12MB/min	\$1199	\$1269
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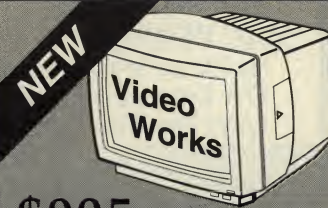
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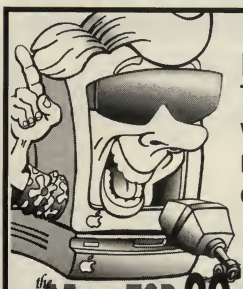


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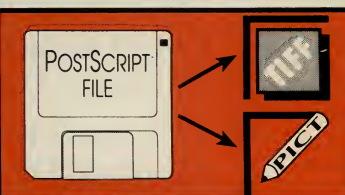
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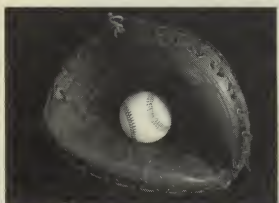
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Apple events

From Page 1

called the Apple Event Manager. Apple and some enthusiasts said it offered both users and developers a long list of potential benefits: Development would be faster and less expensive, and applications could be smaller and more focused because events would allow them to pass off secondary tasks, such as checking spelling and creating charts, to other programs. Using the same protocol to communicate over

networks, applications could distribute the processing of complex tasks across multiple Macs or control remote applications. And most importantly, users, administrators, consultants and value-added resellers would be able to automate common tasks, even involving multiple programs, by writing simple scripts.

UserLand Frontier scripting software provided a way to realize some of these dreams almost a year and a half ago. But scripts can control applications only to the extent that

they support Apple events. And while AppleScript remained a distant glow beyond the horizon, many developers saw little need to add events support: Why pave driveways before there is a road? Other features that were easier to implement and offered more immediate pay back tended to take priority.

Developers also found it difficult to support more than the four "required" Apple events. "We haven't done it because the possible advantages, such as scriptability, are out-

weighed by the incredible complexity," said Daniel Wood, a programmer for Thinkalong Software Inc. of Brownsville, Calif. "The documentation is hard to find. A small company writing somewhat vertical applications can't afford the expense and hassle of implementing something that doesn't seem to be taking the world by storm."

The lack of example code and events support in development tools created another hurdle. "I'd like to support events," Wood said. "But the class library we use [Symantec Corp.'s] Think Class Library does not support it internally. This means that we'd have to rewrite Think Class Library from the ground up, which goes against the whole purpose of using an existing class library."

To take maximum advantage of Apple events, developers must adopt the "Apple-events object model," a technique for representing a program's functions and data types to other programs. While Apple has vigorously promoted the object model, developers said it requires substantial changes to their applications, and many questioned whether the effort is justified.

"Full support for Apple events is nontrivial," said Tim Gill, president of Denver-based Quark Inc. "Almost 200 Kbytes of code in QuarkXPress 3.2 is dedicated to Apple-events support."

Many application developers also found little cause to sit down with their competitors to set standards, known as event suites, for the events supported by particular application categories. Yet without standards for a class of application, supporting events was that much riskier because there was no guarantee that applications would be able to communicate effectively with one another.

Gradually, however, the event-standardization process has progressed, with developers and Apple setting standards for word processing add-ons such as spelling checkers, databases, contact managers, electronic mail and telephony.

The pace of events development may increase now in the wake of the release of AppleScript to developers last month.

Mark Vinshull, engineering manager of AppleScript and Apple events at Apple, said: "I very much expect the shipping of AppleScript to stimulate a lot of [events] development. I think there's going to be an explosion of interest in scripting and application integration. I'm excited that we've reached critical mass."

Quark's Gill said: "There was not a lot of customer demand for it simply because the benefit is not immediately obvious. Even when it becomes available [in QuarkXPress], only a fraction of users, certainly less than 5 percent, will actually sit down and write specialized scripts. But that 5 percent will be the systems people at a company, so the benefits will be to more than just the 5 percent."

Some users are already basing application purchase plans on Apple-events support. For instance, Kerry Northrup, technology editor for Gannett Company Inc. in Burlington, Vt., is using Chena Software Inc.'s Fair Witness to build a newsroom-management system called NEWSworks. "NEWSworks works only if each application can interact with the other applications and components of the NEWSworks application suite," Northrup said. "This makes the combination of applications more capable than just any collection of individual pieces of software." □





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Latest ruling in copyright suit means setback for Apple

By Lisa Picarille

San Francisco — U.S. District Judge Vaughn Walker last week threw out the last three specific Windows interface features still in dispute in Apple's copyright case against Microsoft Corp. and Hewlett-Packard Co.

In a 36-page decision, Walker also tossed out five of the remaining nine HP New Wave features. The original suit targeted 189 Windows features and 147 New Wave features.

In addition, Walker reduced Apple's copyright claims by declaring the Mac interface to be derivative of Apple's outmoded Lisa.

At the same time, however, the judge left open the issue of the overall similarity of the companies' interfaces. That part of the ruling is an apparent about-face from Walker's order last June that the case be argued on the basis of specific interface elements.

"This was not a happy day for Apple," said

Dan Kaufman, an attorney with Brobeck, Phleger & Harrison of Palo Alto, Calif. "Walker seems to have ruled that Windows has no particular infringing elements, but from Apple's point [of view], Windows is still derivative of the Macintosh."

A jury trial to determine the overall similarity of the interfaces is scheduled for June 28.

"Even if Microsoft loses, the amount [it] would have to change in Windows is small," Kaufman said. □

Jot

From Page 1

Jot, although the technology will be part of the Macintosh in the future, according to a company spokesperson.

Earlier this month Apple showed a prototype pen-based version of the Duo 230, code-named PenLite, to attendees at its Worldwide Developers Conference in San Jose, Calif. The company is expected to start test-marketing PenLite late this summer. PenLite's software architecture, code-named Rolex, embeds electronic ink inside PICT files.

But while the Macintosh will use Jot, Newton may not take advantage of the ink standard. According to Frank O'Mahoney, Apple Personal Interactive Electronics spokesman, his division is currently evaluating the standard and has not decided whether to adopt it.

Jot will be supported in GO's PenPoint operating system by year-end, according to Jerrell Jimerson, PenPoint product manager.

"We will incorporate support for Jot at the OS level and also in applications where it makes sense," Jimerson said.

And Microsoft will implement Jot in Windows for Pen, a spokeswoman said.

General Magic said it will make Jot part of Telescript, its cross-platform communications standard. But ink is just one of the content formats Telescript will support, company spokeswoman Jane Anderson added.

General Magic OEMs, including Motorola Inc., Matsushita Electric Industrial Co., Sony Corp., EO Inc. and Apple, will be able to use Telescript as one way to save and exchange data using Jot.

Not all Jot partners are bullish on ink. Lotus demonstrated a pen-based version of its cc:Mail electronic-mail package at its InterChange '92 user-group conference last September, but customer response to the product halted further development.

"Although people thought it was wicked cool," said Bob Steingart, Lotus director of product marketing for mobile computing, "when asked if, at this time, they would really buy one, the enthusiasm fell off pretty quickly."

Steingart said that Lotus has no immediate plans to commit to a pen-based package.

An industry standard for ink is essential in garnering wider support for pen-based computing, observers said.

"The methods of representing electronic ink will be as important to [the next] round of computers as ASCII was to the current round of computers," said Portia Isaacson, president of the Colorado Springs, Colo.-based Dream IT Inc., which publishes the Pen Report. "Without [a standard], you would not be able to exchange even the most basic files [from pen-based devices]." □

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DeskJet

From Page 1

The DeskJet 1200C/PS costs \$2,399 and ships with 4 Mbytes of RAM, which can be expanded to 16 Mbytes. HP said a Level 2 driver for the printer will be available on-line by the end of the month, and the company next month will begin shipping it with the printer. HP also offers the DeskJet 1200C, a \$1,699 PCL 5-only configuration that comes with 2 Mbytes of RAM. Both the 1200C and the 1200C/PS should be available in stores this week.

HP offers a variety of network interfaces for the printer. LocalTalk and Centronics parallel connections are standard, and you can also install an EtherTalk card for \$449 (for 10BASE T) or \$499 (for 10BASE T/10BASE 2). A token-ring card is available for \$699.

Dual-duty printing. The DeskJet 1200C/PS can function as a decent black-and-white device as well as a very good color printer for the office. We found it easy to set up, reasonably fast and capable of good output. Our prerelease version had some of the problems associated with any low-resolution inkjet, but its faults are few, its virtues are many, and the price is right.

HP offers a variety of specialized media for the printer, such as transparencies, glossy paper and labels. The DeskJet 1200C/PS also does a good job on standard laser or copier paper, although the glossy paper produces brighter colors.

When printing complex color files, our 4-Mbyte configuration bogged down. Anyone considering using this machine for serious color work might give thought to adding memory. The printer does not support a hard disk, so fonts are loaded with each job. This is one of the printer's few major failings.

Features and setup. Setting up the 1200C/PS was simple. Illustrations in the manual cleared up the few ambiguous points. Installing the four CMYK (cyan, magenta, yellow, black) color cartridges was a snap — literally, two snaps. Installation took no more than 10 minutes, and a test sheet ran perfectly the first time.

Clearing paper jams is extremely simple, since the whole paper path is readily accessible. Switching paper modes and running diagnostic tests are simplified by easy-to-understand front panels. Indicators show the ink level of the four cartridges at all times.

Speed and output. We found the printing engine adequately speedy for day-to-day tasks. Simple text pages took about two minutes, while simple color pages took from two to five minutes. Complex Adobe Illustrator pages took considerably longer, as did documents longer than 10 pages; this may be a function of the limited RAM in our unit, and HP's forthcoming Level 2 driver should also speed output.

There are limits to the quality of output from any desktop color inkjet printer, but the colors of the DeskJet 1200C/PS are as smooth as those from a good thermal-wax printer, even on plain paper. We found that printing on plain paper helped minimize any banding artifacts, although the colors were a little duller. The telltale rosettes used in halftoning were visible at close range but did not cause moirés. In short, the 1200C/PS produces very acceptable output of solid colors and continuous-tone images.

Color was relatively accurate, although RGB (red, green, blue) primaries were off target in some applications, a problem we have seen with other desktop CMYK printers.

Text output from 4 to 500 points was very

sharp on transparencies and glossy or plain paper. The type approached laser quality, although we noticed a few slightly ragged edges on closer examination. More remarkably, color type was as crisp as black type.

The ink comes out of the printer surprisingly dry. Even plain paper covered with highly saturated colors can be handled immediately after printing. The ink is water-soluble, however.

Conclusions. Offering good color output and versatility at a reasonable price, the DeskJet 1200C/PS typifies the best of the HP line. It shouldn't be viewed as the primary printer in a business environment, but it is an ideal adjunct to a black-and-white laser printer for groups that have color needs, whether printing color charts from Microsoft Excel or presentations from Aldus Persuasion.

Hewlett-Packard Co. is at P.O. Box 58059, MS 511L-SJ, Santa Clara, Calif. 95051-8059. Phone (800) 752-0900; fax (208) 344-4809. □

Open Sesame!

From Page 1

action three or more times, Open Sesame! will describe in plain English what it has learned and ask users whether they would like to have the task automated.

Open Sesame! shares some characteristics of No Hands Software Inc.'s Magnet, which users can instruct to automate finding, copying, moving and synchronizing files. But Open Sesame!'s underlying neural network and expert-system knowledge base lets the program "learn" by itself exactly how an individual goes about routine actions.

The program, which processes information when the computer is idle, learns by constructing "if-then" statements about users' actions. For example, "If file is dropped in Trash, then Trash gets emptied" could be the initial statement, which Open Sesame! would refine as users perform additional actions.

Users can further instruct the agent on how to automate a task, such as emptying the Trash a certain number of minutes or hours after a file is dropped. Users can also tell Open Sesame! whether or not to notify users each time it acts.

The program will follow users as they switch among applications, as long as the applications involved support the necessary suites of Apple events. For example, if a user always opens QuarkXPress and Deneba Software's Canvas and subsequently arranges open program windows to sit side by side on the desktop, Open Sesame! will be able to automate that action.

Among the other actions the program can learn are opening and closing groups of documents or folders, synchronizing the contents of folders, and rebuilding a user's desktop at specified times.

If users don't want to be bothered while they are working, Open Sesame! will keep a background log of the repetitive actions it observes for the user to later view, modify and save as instructions to be carried out.

Open Sesame! will use an average of 450 to 500 Mbytes of memory, the company said.

Charles River Analytics Inc. is at 55 Wheeler St., Cambridge, Mass. 02138. Phone (617) 491-3474; fax (617) 868-0780. □

Price cuts

From Page 1

knocked down the price \$200, or 16 percent, to \$1,050.

► **PowerBook Duo 210.** The dealer price has been cut \$170, or about 11 percent, to \$1,375 — the second price reduction in as many months. Introduced in October 1992 at a retail price of \$2,239, the Duo 210's list price was reduced to \$1,839 in April.

An Apple communication to dealers said the reductions were necessary for the company to realign price and performance in the fiercely competitive personal computer market.

Dealers, however, said Apple had to reduce prices to stimulate sales for Mac models that either haven't sold well or could be obsolete in several months because of forthcoming new products.

"Of course Apple says they want to realign prices. That means they're saying, 'OK, it's not selling. Let's cut the prices and move some of these things,'" said Reid Cooper, owner of Tech Computer Inc. of Cambridge, Mass. "They're just putting it in fancy words. It really means they have a ton of them sitting in their warehouses."

Nonetheless, Cooper said reduction of the Color Classic's price to just more than \$1,000 would fatten its margins and make it more attractive to dealers. "I don't carry it now, but I plan to in the future," he said.

Users had a more tepid response to the

New Mac, printer prices

CPUS	DEALER PRICE	% DROP
Mac Color Classic	\$1,050	16
PowerBook Duo 210	\$1,375	11
Centris 610 4/80	\$1,325	10
Centris 610 4/80*	\$1,400	10
Centris 610 8/230	\$1,850	8
Centris 610 8/230**	\$2,150	7
PowerBook 165c	\$2,650	16
PRINTERS	LIST PRICE	% DROP
Personal LaserWriter NTR	\$1,179	29
Apple Color Printer	\$1,659	29

*With Ethernet. **With CD-ROM.

modest price cuts. Ray Kirtland, senior systems analyst for Macintosh network projects at Sprint Corp. of Kansas City, Mo., said lower prices are "always nice" but added that the only model Sprint is likely to buy more of because of the discounts is the Centris 610.

In related news, Apple last week added the Apple Basic Color Monitor to its price list. The 14-inch monitor costs \$329. It was introduced for education customers in February for \$349. □

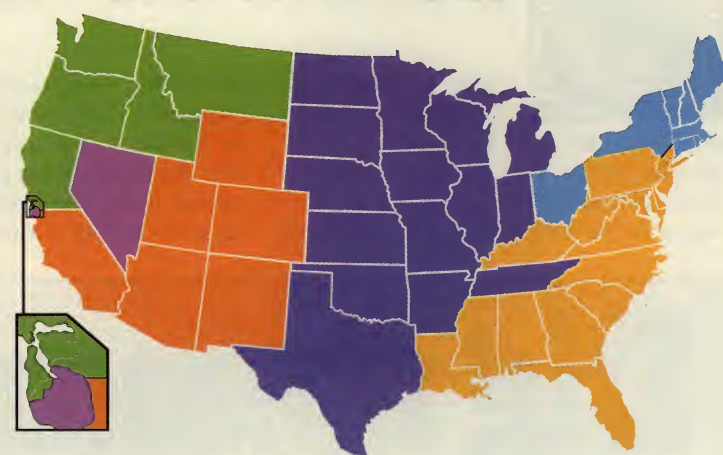
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Looking ahead



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June 7	Mass Storage Special Report Workgroup software	May 27	May 25
June 14	LC II add-ons	June 3	June 1
June 21	GA Spec. Rpt. Sound	June 10	June 8
June 28	Cross-platform tools	June 17	June 15
July 5	Database	June 24	June 22
July 12	Gateways Presentations	July 1	June 29
July 19	Vertical markets Contact software	July 8	July 6



Behind the virtual office door

Rumor has it that every nerd in the western world was sucked into Oliver Stone's little televised scam last week. For those who have a life, the plot revolved around a nefarious attempt by the bad guys to take over the world

with a virtual-reality product called Church Windows. Unfortunately, both the plot and the dialogue were so lame that only those who were able to make it past the first episode discovered the true worth of the project, that being the privilege of witnessing Angie Dick-

inson's imaginative and frightening interpretation of a character that was based, according to one theory, on the very real Bill Gates.

The reality of virtual reality will more likely integrate itself gradually into our everyday lives through our business toys without our

taking notice. As evidence, consider General Magic's unveiling a few months ago in New York. Attendees were treated to a video highlighting the Magic Cap front end for telecommunications functions.

The Magic Cap metaphor is based on a 3-D representation of an actual office, complete with separate rooms, doors, hallways and other common objects. There will be PCMCIA doors, for example, that give you access to PCMCIA functions. This may be a long way from virtual reality, but it's arguably the next logical step after the 2-D desktop metaphor.

Question of control. We may not know much about the potential, virtual or otherwise, of Church Windows, but we're learning more about the potential of the Windows we do have every day.

Next month we'll learn all about Microsoft's plans for a programming interface standard to let Windows control our office machinery (fax machines, copy machines, coffee makers and the like). This month we learn that Apple has a similar project in the works. Why it's playing this particular card so closely is still a matter of speculation.

It's not the humidity. Only the first of the quartet of PowerPC chips already promised is in the hands of developers, but the Knife reports that several design teams have already been fielded to start work on the next generation. The Knife's sources are already speculating about the complexity of the task. While the 620, the most powerful of the first-generation PowerPCs, will include about 5 million transistors, the second-generation PPCs will apparently have up to twice that many.

Does this mean that the PowerPC will one day become a source of heat pollution to rival Intel's new Pentium? Let's hope not. At the recent WWDC, Apple's David Nagel showed a slide depicting a hot dog roasting over an open Pentium. We wouldn't want that particular image to come back to bite him. Fortunately, Apple's boasting of a very low power-consumption-per-square-centimeter ratio, so Dave's probably safe.

Videotelephony you can afford? Bad television notwithstanding, video is where it's at in the electronics world, and we might as well accept that fact and go for the best new products. This week's pick is SuperMac's new videoconferencing system. The Knife says it's similar to ShareVision Technology Inc.'s ShareView Plus, except that it's expected to list for about one-tenth of the ShareVision system's price (\$4,499 per node) before you add in the price of the camera.

The SuperMac system, code-named Spigot-Phone, is allegedly based on its VideoSpigot QuickTime digitizer cards. The announcement could come as early as next month at Digital World '93 in lovely Beverly Hills. □

Let's see how simple and direct we can make this: MacWEEK mugs are not free, no way, no how. You can't get one just by calling up and asking for it. On the other hand, if you've got some juicy inside info, you can find out exactly how easy it can be to get a mug by contacting the Knife at (415) 243-3544, fax (415) 243-3650, MCI (MactheKnife), Internet (mac_the_knife@macweek.ziff.com), AppleLink (MacWEEK) or CompuServe/ZiffNet/Mac. Cheers.

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